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A DEFINITE STATE FOREST POLICY NEW YORK STATE'S PROGRESS IN REFORESTING THE ADIRONDACKS

BY E. A. STERLING

INTENSIVE forestry is dependent, among other things, upon a ready and accessible market for both major and minor forest products, adequate transportation facilities, and the use of capital drawing a low rate of interest. Stated inversely, intensive forest work is not practical in remote regions, and crude, wasteful lumbering methods, through no fault of the lumbermen, must be followed where density of population and stability of conditions do not permit more conservative methods and provision for the future.

The State of New York, by virtue of age, population, wealth, and transportation facilities, would seem to have approximated European conditions sufficiently to justify intensive forest management, both on State and private lands. As bearing this out, we find that forestry principles are finding application on large forest areas under ownership by the State, this policy having developed for the first time in America in the State which is foremost in many lines of industry and perhaps best fitted to father such a policy. While the existence of a definite State forest policy is an actual fact, it happens that it cannot be primarily attributed to the theoretical factors mentioned, nor based on the same conditions which obtain in Europe. But the work is no less commendable on this account. The real cause for the extensive forestry policy on State timberlands in New York is founded primarily on the preservation of the Adirondacks watershed and on the desire of wealthy citizens, particularly in the larger cities, for the maintenance, at the State's expense, of the enormous

natural park and playground in the wild and yet easily accessible region comprising the Adirondack mountain uplift.

A brief historical review is necessary to a clear understanding of the conditions existing and the work going on today. As far back as 1872, Horatio Seymour, twice Governor of the State and once a candidate for President, perceived the need for State ownership of the Adirondack watershed. Through his initiative a State Park Commission was appointed, which, after investigation, found that the State then owned only 40,000 acres in that region. Eleven years later, in 1883, the recommendation of the first Park Commission forbidding further sales of State lands and their retention when forfeited for the non-payment of taxes received consideration. By acting upon these recommendations the State came into possession of 600,000 acres of delinquent tax lands. A Forest Commission was appointed under the Act of 1885 and was superceded ten years later by a Commission of Fisheries, Game and Forests; while in 1903 the Commission was changed to a single Commissioner, and in 1910 to a Conservative Commission.

In 1897 new legislation was passed and an arbitrary area was set aside as a State preserve, bounded by the so-called "blue line." A Forest Preserve Board was appointed to purchase additional forest lands within the proscribed limits, and some \$3,500,000 was spent up to 1907 for the purchase of forest lands. This policy of consolidating the holdings within the proscribed forest park limits has been fol-

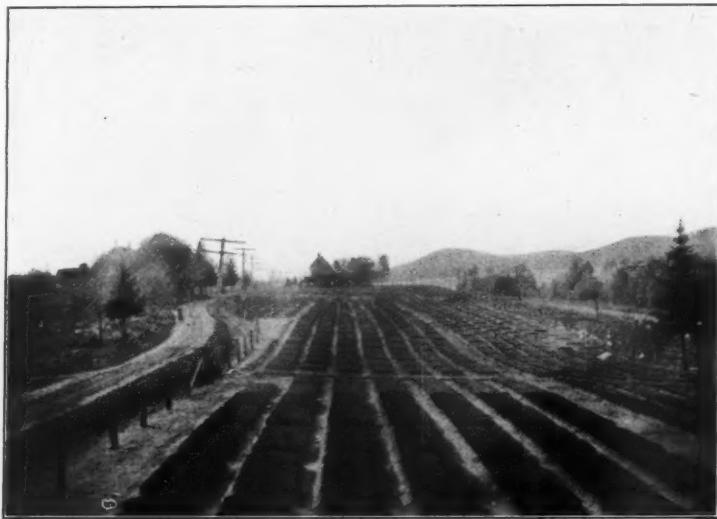


Photo by R. E. Gooding.

SECOND YEAR SEED BEDS PATNODE NURSERY, LAKE CLEAR JUNCTION.
(There are in this nursery of approximately two acres over five million seedling trees.)

lowed with several intermissions up to the present time, and in 1911 the total State holdings comprised 1,643,000 acres, of which all except 112,000 acres in the Catskills, is located on the Adirondack plateau. The total area within the park limits comprises about 3,400,000 acres, so that the alienated lands still comprise about one-half of the total area.

The acquirement by a wealthy State of such an enormous area of forested and potential forest land is a mark of a distinct progress. The reverse side of the picture is that enthusiastic but ill-advised reformers, with all good intention, succeeded in 1893 in securing the passage of a constitutional clause preventing the cutting of trees, dead or alive, on State lands and declaring that they shall be kept forever, as "wild lands." This clause, which has never been repealed, prevents putting these State lands to their best use. Forestry cannot be practiced without cutting trees, and this is particularly true in the Adirondacks, where overmature stands of hardwoods need to be removed in order to establish a more valuable growth of coniferous species. If the State foresters were permitted to han-

dle these Adirondack lands according to forestry principles, they would be able not only to greatly improve the forest conditions, but secure an income for the purchase of more lands or with which to reimburse the State treasury for expenditures already made.

During the last ten years this constitutional amendment has been set aside by the Commission to the extent of planting up some of the burned-over areas, while more recently permission has been granted by the Legislature to remove trees from burned areas in order to reduce the fire danger. Under the existing conditions, it follows, therefore, that the work of the State at present is mainly along the lines of reforestation and fire protection, and since this work is being carried on in a very extensive way and very efficiently, it constitutes a matter of more than usual interest.

It may be added that the initial conception of planting Adirondack lands came from Dr. B. E. Fernow, while he was Dean of the New York State College of Forestry, and the first forest nurseries in the State were started by him in connection with the College demonstration forest.



Photo by R. E. Gooding.

PORTION OF LAKE CLEAR NURSERY, LAKE CLEAR JUNCTION, N. Y.

The first forest planting on State land was done in 1901 in the Catskills. No appropriation for such work had been made, but A. Knechtel and R. C. Bryant, newly appointed State Foresters, secured a gift of 500 white pine and 500 Norway spruce transplants from the nurseries of the New York State College of Forestry at Axtion in the Adirondacks, and set them out with help furnished voluntarily by residents near Phoenicia in the Catskills. It is interesting to note that these trees were grown originally in Germany, shipped to this country as seedlings and put out in transplant beds in New York. It also happened that when the first nurseries were started in connection with the Cornell demonstration forest, white pine seeds were not available in this country, where this tree at the time was king of lumber woods, but they had to be obtained in Germany from white pine forests started from seed obtained in America over a century before.

From the humble beginning made in 1901 with a thousand trees, the State reforestation work has grown until this year over five million trees were shipped from the State nurseries. In the fall of 1901 an additional 5,000

trees were planted but extensive operations did not begin until the following spring. During April and May, 1902, nearly 600,000 seedlings and transplants were set in permanent plantations in the vicinity of Lake Clear Junction in the Adirondacks, this being the largest planting operation undertaken by State, Federal or private enterprise up to that time. The plant material was procured from the College of Forestry nurseries at Axtion and Wabek, and was made up of Scotch and white pine, Norway spruce and European larch. It is significant that the pines have made the best growth during the ten years the plantation has been established, being now a solid forest of trees 10 to 15 feet high. The spruce succeeded only on the better lands and proved unsuited for the more sterile burned-over areas. This should carry a lesson to the pulp and paper companies who are desirous of reforesting with spruce, and show the necessity of promptly replanting logged areas before repeated fires have impoverished the soil.

During the years since the planting was started the work has gone ahead with rather fewer breaks than are to be expected when legislative appropri-



IMPORTED NORWAY SPRUCE TRANSPLANTS.
(Note large loss and poor condition.)

NORWAY SPRUCE TRANSPLANTS GROWN FROM SEED AT SARANAC NURSERY. Photo by R. E. Gooding.

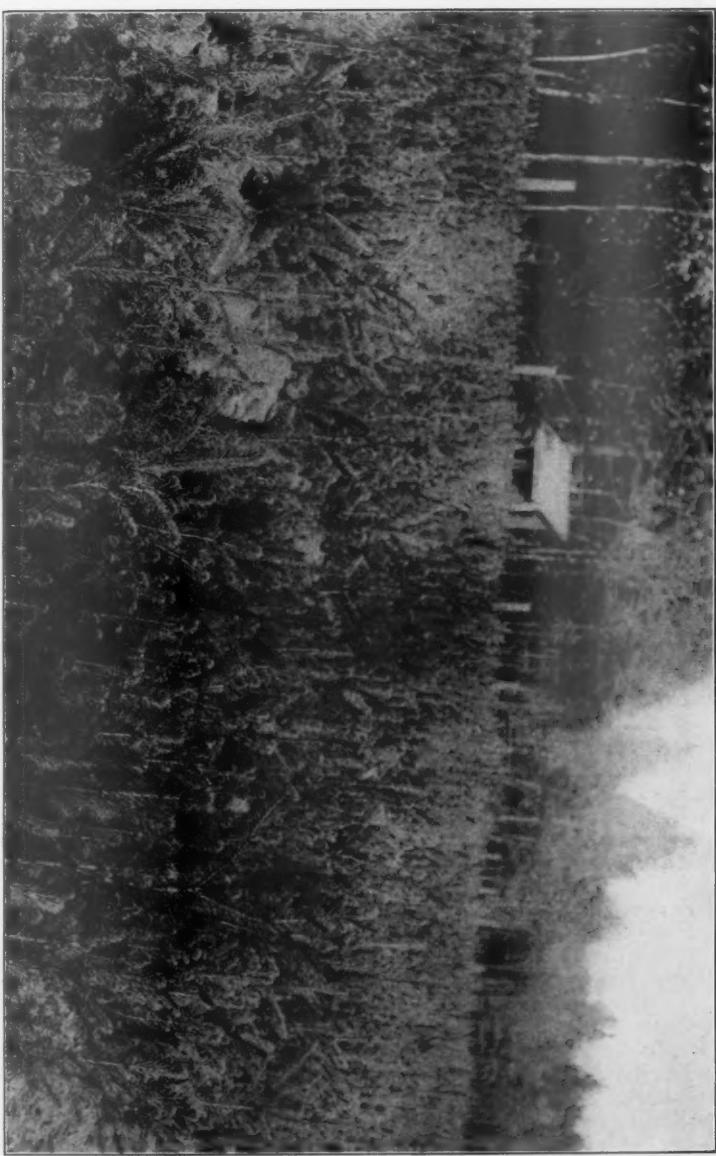




Photo by J. W. Stephen.

PORTION OF SALAMANCA NURSERY.

ations have to be depended upon. The operations have proceeded along the accepted lines and also included a large number of experiments in broadcast sowing, seedspot planting, etc. In all a total of about 6,000 acres of waste land in the Adirondacks have been reforested, and under the present management it can be expected to develop along lines of even greater efficiency and magnitude. The present Conservation Commission is active along various lines; while Clifford R. Pettis, who as State Forester built up the state nurseries, is now Superintendent of State Forests and in charge of all work relating to the State forest lands.

In 1902 a nursery site was selected at Saranac Inn Station and during the next two years it was fully developed and greatly increased in size. Since that time two additional nurseries have been developed near Lake Clear, one at Salamanca, one at Saratoga, and this year a new one is being started at Comstock where convict labor will be used. In these seven nurseries over ten million trees will be produced annually for planting State land and for distribution to private land owners. During the past four years over 1,500

shipments have been made to private owners for reforesting their own land, the sales this spring alone approximating four million trees and the supply has never been adequate for the demand.

We, therefore, have within a night's ride of New York City the largest and best organized reforestation operation ever attempted in this country outside of the Federal government. The task is the reforestation of millions of acres of waste land which would never have any value for agriculture, and the creation of an asset to replace a liability. The reward will be in the benefits which will accrue to the State and the people in the form of timber and watershed protection for all time to come. It is a work which should inspire enthusiasm on the part of wood producer and wood consumer alike, and should have the support of everyone who has any spirit of patriotism. The reforesting of these enormous waste areas—and New York State has about 3,000,000 acres of such land or nearly 10% of its total area—is being done in the best and only way possible. The lamentable phase of the situation is that it should never have been



Photo by F. J. Rogers.

WHITE PINE TRANSPLANT SAME AGE AS TREE IN
ADJACENT PICTURE, BUT PLANTED IN THE OPEN.

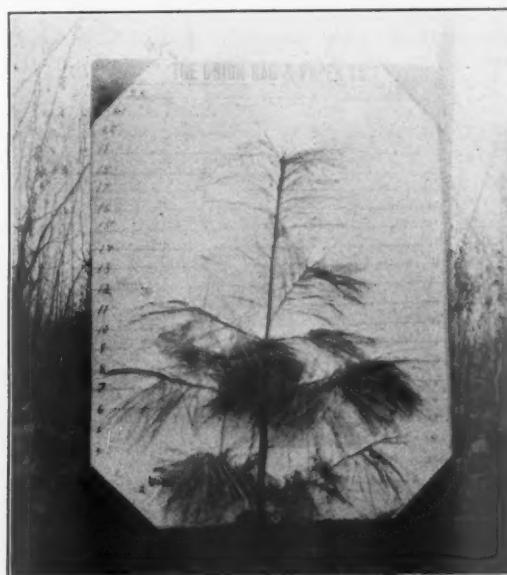


Photo by F. J. Rogers.

WHITE PINE TRANSPLANT TWO YEARS AFTER
PLANTING SHOWING GROWTH OF ELEVEN
INCHES. THIS TREE WAS PLANTED UNDER
LIGHT SHADE.



Photo by R. E. Gooding.

FIRST SEED BEDS PATNODE NURSERY, LAKE CLEAR JUNCTION.

necessary to plant trees on a large percentage of this area, because natural reforestation would have reclothed the ground if even reasonable care had been given in lumbering, and if adequate protection from fire had been afforded.

There is another forest planting problem in the Adirondacks which is entirely aside from the replanting of areas denuded by lumbering and fire. The original forests were a mixed growth of hardwoods and conifers. The conifers, first the pine and later the spruce and balsam, have been removed over hundreds of square miles because they early had a market value. On these areas the old hardwoods which were left have closed in and usurped all of the growing space.

These hardwoods are now coming into their own and have a value which justifies their removal. From the standpoint of good forestry, common sense, and cold, callous commercialism they should be cut and replaced promptly with the more valuable, faster growing softwoods. This was preached years ago but it was not taken very seriously until recent demands made the logging of hardwoods a profitable

operation under certain conditions. Men familiar with the hardwood business now believe that the hardwoods in the Adirondacks should be cut and softwoods substituted. On a financial basis this policy is justified because the value of hardwood stumpage per acre is about equal to the cost of replanting with conifers. This being true there is no loss if the lumbermen cut their hardwoods and replant, the investment remaining the same if the profit from the hardwood is reinvested in young plantations. In the one case the owner would have an over mature hardwood forest, depreciating because of age and decay. On the other hand a fast growing young forest of valuable species worth at maturity, even at present prices, many times the value of the old hardwood stained.

The only strong opponents of the cutting of the hardwoods and their replacement by young trees of high value are the wealthy residents down the State who use the Adirondacks as a hunting and recreation ground. Their motives are selfish, narrow and unworthy of good citizens, their only excuse being that they do not fully understand the situation. The Adiron-



Photo by R. E. Gooding.
PORTION OF SARANAC INN NURSERY.



Photo by C. R. Pettis.
NORWAY SPRUCE SEEDLINGS IMPORTED FROM GERMANY. OUT OF A
SHIPMENT OF 500,000 TREES LESS THAN 20,000 COULD BE USED.

dacks would hardly be cut over and re-planted in a day, the transformation would be so gradual as to be hardly noticed, and a great improvement would be effected in the end. The change is needed but public sentiment is a curious thing and is not easily persuaded.

The work of fire protection in the forests of New York State is another story, but it should be said in connection with the reforestation work that the men who are in charge of the State's natural resources realize that the extensive planting now being done will go for naught unless fire is absolutely eliminated from the plantations. The present fire protective system is one of the best in the country, and under normal conditions can be depended upon to save not only the plantations but such remnants of the original forests as remain.

An object lesson, such as is being given by New York, is needed in many other States, in fact some of the States are not far behind. Through the efforts of the American Forestry Association a party of lumbermen and public-spirited business men visited the Adirondacks in early May of this year and saw for themselves the work which is going on. If they did not learn a valuable lesson it was their own fault, and there is every reason to believe that they went home in a new frame of mind and with a much keener appreciation of the relationship of the timber-land owner to the State, and of the work which the State in turn is doing to undo what commercial necessity and carelessness—not riotous greed—had previously done.*

*Photographs by courtesy of the New York State Conservation Commission.

RETURNING LAND TO IDAHO

O permit the State of Idaho to obtain land in lieu of 90,000 acres of school lands included in National Forests prior to survey, President Taft has eliminated about 4½ Townships from the St. Joe National Forest. These lands will be held and managed as a permanent State forest. This action by the President carries out an understanding which was reached with him by Governor Hawley and other representatives of the State of Idaho about a year ago. The State had tried to make indemnity selections for various school sections lost to it through the creation of National Forests, but before the acceptance of the State's filing the intended indemnity selections also were included in National Forests. To learn what relief could be obtained Governor Hawley decided to go to Washington and take the whole matter to the White House.

Under this agreement the State has undertaken to retain a designated body of land permanently for forest purposes, provided the Government would permit title to be acquired. The area designated comprises largely though not entirely the lands for which the State made its original application. This 90,000-acre tract will, under the agreement reached, be protected by the State against fire and other destructive agencies, and administered similarly to the National Forests. Timber will be sold only under such stipulations as will insure reproduction of the forest, and favorable streamflow conditions will be maintained through preservation of the necessary forest cover. The elimination now made by President Taft permits the carrying out of the arrangement, so far as concerns acquisition of title by the State.

A NEW FORESTER.

Irving Southworth, of Johnstown, N. Y., who has recently finished a course in forestry, and has traveled extensively through the south, west and also in Germany, has secured a government position on the Blumas reservation, California.

THE DISMAL SWAMP OF VIRGINIA*

BY ARTHUR HOLICK

THE Dismal Swamp, usually called the Dismal Swamp of Virginia, lies partly in Virginia and partly in North Carolina; but it is more accessible from the former, and as most of those who have explored or visited it have entered from the Virginia side, the name of that State is commonly linked with it. Its topographic, geologic, biologic and economic features may be found described in numerous governmental reports; many historical events are connected with it; it figured more or less prominently in certain events of the Civil War, and it has been made the subject of numerous articles, stories and traditions published in works of fiction and in magazine and newspaper literature.

The area of the swamp is about 1,500 square miles. The surface is almost level, sloping gradually from the southwest toward the northeast, with an elevation above mean tide level of from 23-12 feet, and in consequence, the drainage is so imperfect that, throughout most of its extent, it remains constantly inundated. Certain portions, however, become more or less dry in periods of drought, and quite a large portion of its former area—some 700 square miles along the eastern border—has been permanently reclaimed in recent years, by means of drainage, ditches and canals.

Near the center lies Lake Drummond, an almost circular body of fresh water, about $2\frac{3}{4}$ -3 miles in diameter, with an almost uniform depth of about 6 feet. The surface is now about 22 feet above mean tide level; but previous to the completion of recent drainage operations it was somewhat higher.

The lake may be reached by means of any of the several artificial channels which have been cut through the swamp. Washington and Jericho ditches are only navigable at high water, by small boats or canoes, which have to be poled carefully and more or less laboriously, by reason of the vegetation which has grown into the sides, and the trees which have fallen across in many places, during recent years. In

periods of drought these ditches often become dry and may be used as foot paths or trails.

The Dismal Swamp Canal, however, is a permanent, broad artificial channel, which will probably be made a part of the great interior waterway which is planned to extend from New Jersey to Florida. It is navigable for steamboats of small size and is sufficiently wide for steamboats and barges to easily pass each other. The "feeder," by means of which it is connected with Lake Drummond, is also a wide channel, navigable at all times for row boats, motor-boats, etc., as far as the upper lock, within about three-fourths of a mile of the lake. This lock controls the water of the lake, and a lower one, at Deep Creek, controls the entrance to the canal at tide-water.

During the past year I was fortunate in being able to visit the swamp under unusually favorable conditions, as one of a party all of whom were guests of the Lake Drummond Canal Company. The company provided transportation from Norfolk, by steamboat, up the canal to the mouth of the feeder; thence by large rowboats, towed by a motor-launch, up the feeder to the lock near Lake Drummond, where a camp site had been prepared on the bank of the feeder, and tents and two days' supply of provisions provided. This site was perfectly dry, in a partly cleared area on the border of the forest and was admirably adapted for the purpose. One night was spent there and the following day Lake Drummond was navigated in rowboats, to the mouth of Washington Ditch, where a transfer was made to smaller boats, which were poled up the ditch to Suffolk. From thence the trip back to Norfolk was made by rail. The swamp was thus traversed from one side to the other; two days and a night were spent there, and unusual opportunities for observation were enjoyed.

The camp site had been covered with a dense growth of "cane brake" (*Arun-dinaria macrospelma*), but a large area was cleared for our accommodation.



CAMP SITE ON BANK OF "FEEDER," NEAR LAKE DRUMMOND.



BALD CYPRESS, SHORE OF LAKE DRUMMOND.



SUNSET, LAKE DRUMMOND.



WASHINGTON DITCH.

This grass is an exceedingly characteristic feature of the swamp, forming dense thickets and growing to a height of six or eight feet. The adjacent forest consisted largely of red maple, persimmon, sour-gum, willow-oak, ash, and magnolia, with scattered trees of yellow pine, white cedar and bald cypress. One of the most abundant and striking features was the "jassemín" (*Gelsemium sempervirens*), whose clusters of fragrant, yellow flowers were to be seen everywhere, entwined in the undergrowth.

At night the scene in the vicinity of the camp was rendered weirdly beautiful by the glow of "fox-fire" on the stumps of the trees and in the débris of the forest floor. I had often seen this phenomenon in other localities, but never before to the same extent or brilliancy. The phenomenon is caused by certain fungi, especially in the genera *Panus*, *Clitocybe*, and *Armillaria*, and also by many bacteria; but its nature is not thoroughly understood. It is commonly spoken of as "phosphorescence"; but this is a misnomer as it is not due to phosphorus but to the process of oxidation. A better term to use would be "luminescence."

Undoubtedly, however, the bald cypress (*Taxodium distichum*) is the most striking feature of the swamp. These trees never fail to excite the wonder and admiration of every observer, especially when seen for the first time. The massive buttressed base; the peculiar processes known as "knees," which rise from the roots; the tall straight trunks, and the delicate, feathery foliage, mark these trees

as unique in our modern flora. In many respects they resemble the redwoods and giant sequoias of the Pacific coast, and, like them, they represent the type of a genus which reached its maximum of development in past geologic ages and is now on the highroad to extinction. The bald cypress will grow in high, dry ground; but its natural habitat is in swamps. It thrives and flourishes under conditions which would be fatal to most other trees, with the roots permanently immersed and often with the base of the trunk entirely surrounded by water. Splendid examples are to be seen on the shores of Lake Drummond, where they constitute almost the sole feature of the outer zone of the lake border vegetation. Many individual trees, isolated from their fellows, grow well out in the lake, constituting one of its most striking features.

The water of the swamp is dark-colored, but clear, resembling strong tea, and has an acid reaction and remarkable antiseptic properties. It is palatable and wholesome and keeps wonderfully well, without becoming foul. In former years it was much used on ships, especially on those about to make long voyages. That from the white cedar areas, known as "juniper-water," was considered the best. Even where the ground is saturated, and the water stagnant, there is an entire absence of the odors which are generally noticeable in salt marshes and in many fresh water swamps where there is abundant decaying vegetation.

*Article and pictures by courtesy of the Journal of the New York Botanical Garden.

AN EXPLANATION

IN justice to Mr. Theodore S. Woolsey, Jr., who contributed an excellent article on the Harvard Forest School for the April number of AMERICAN FORESTRY, the editor desires to explain that owing to lack of space it was impossible to use the carefully and skillfully tabulated statistical tables by which Mr. Woolsey showed

the actual results obtained with various trees under different conditions, and made a number of yearly comparisons which would have been of great interest to the student. The editor regrets that it is necessary, owing to lack of space, to eliminate statistical tables from most of the articles submitted which contain them.



SUNDAY AT THE CAMP OF THE UNEMPLOYED, SAN DIEGO, CAL., MUNICIPAL FOREST.

SAN DIEGO'S MUNICIPAL FOREST

BY MAX WATSON, *Public Forester*

NOW that the United States is realizing that period when it becomes expedient to look forward to its future timber supply and the fact becomes apparent that within less than a decade it will be necessary to create forests to fill the demand which cannot be supplied by our fast diminishing forests, it is rather interesting to note the manner in which this future want will be provided. Of all the natural resources which are primarily a public asset, there is none on which the public well being is more dependent than the forests. Therefore it follows that our future forests should be established by the community as a whole rather than by its individual citizens for the benefit of the individual and not the community.

Several of the cities of Europe have furnished us with creditable examples of what a community may accomplish through the establishment and maintenance of a Municipal Forest, but until

recently such an undertaking had not been attempted by any city of the United States. That the City of San Diego, situated in the most southwestern corner of the United States, should be the first to systematically establish a Municipal Forest, might seem rather extraordinary at first glance to those familiar with Southern California, and the natural flora of that region. The country is bare of any natural forests except upon the highest mountains, and the limited rainfall would seem to be adverse to an undertaking of this kind. Nevertheless the fact that this city is now engaged in such a work indicates that there must be conditions which make such an undertaking within the realms of practicability.

The first and most important reason is the fact that San Diego stands apart from other cities in that she is the possessor of nearly seven thousand acres of land within her limits. This land came into the possession of the



VIEW OF A SECTION OF ONE-YEAR-OLD GROVE, SAN DIEGO, CAL., MUNICIPAL FOREST.

city at the time California became a State, when all of the old Pueblo of San Diego was deeded to the city by the National Government. Thus, San Diego became the owner of practically all the land within its limits, but the greater portion was sold during the early days until only the seven thousand acres now in its possession remained. The land is located ten miles north of the city proper. For the most part it is what is known as mesa land, lying about three hundred feet above the sea. It is rather rolling, and traversed at intervals by deep canyons, running to the sea. The virgin covering of this section consists of the native grasses and characteristic chaparral of Southern California; the largest growth on the mesa land being the Sumacs (*Rhus Laurina* and *Rhus Integrifolia*). For the most part the soil is of a sandy nature varying in depth from two to twelve feet. The mesa soil is underlain with a sand hardpan which is not impervious, and can be penetrated by roots if sufficiently moistened.

Being the possessor of such a tract, the city had the land upon which to

establish a forest, but before such a thing became possible it was necessary also that there should be a tree, which was adapted to the soil, and climatic conditions, and which was of commercial value. In selecting a tree for the creation of a forest there are three main factors upon which the selection of the species is determined. First: The timber produced must be adapted for general use. Second: The species must be suited to the soil and climate of the location selected. Third: The tree must be the one which will come to maturity in the shortest possible time.

Southern California has in the Eucalyptus a tree which fills these requirements completely. The Eucalyptus is an acceptable substitute for almost any of our American hardwoods. It is adapted to the climate of Southern California even better than to its native land, and its rapid and thrifty growth in this locality is unsurpassed by any tree in the world.

When the charter of the city of San Diego was revised in 1908, the possibility of the establishment of a successful Municipal Forest upon the Pueblo



LOOKING ACROSS CITY LANDS TO THE SHORE; NURSERY IN THE FOREGROUND. SAN DIEGO, CAL., MUNICIPAL FOREST.

Lands was realized by some of the farsighted citizens, who secured the insertion of a clause, which exempted these lands from sale until 1930, and provided a tax of two per cent per hundred on the assessed valuation of all city property for the improvement of these lands.

No further action was taken until the fall of 1910, when a Pueblo Forester and Assistant were appointed with instructions to establish a headquarters upon the land, and plant forty thousand trees, as the beginning of a municipal Forest. The necessary buildings were erected and implements purchased and a water system installed for domestic purposes for the establishment of a nursery for propagating the trees to be planted.

The rainfall in this section is only ten and one-half inches, and is distributed entirely through the winter months. With such a limited water supply it was necessary to utilize a system of dry farming for conserving the moisture during the summer months, and thereby assisting the trees in developing to the fullest extent.

The land selected for the planting is thoroughly plowed immediately after the first rains to a depth of about ten inches. The rainfall is conserved during the winter by harrowing, and the ground worked into proper condition for the planting, which is done in March and April. The field is laid off in eight foot squares and the trees planted at each intersection. The planting is done with an ordinary garden trowel,



LOOKING ACROSS ONE YEAR'S GROVE TOWARDS FARM
BUILDINGS, SAN DIEGO, CAL., MUNICIPAL FOREST.

and the trees, which are about one foot in height, set into the ground about four inches so as to be well into the moist earth. No water is used in the planting, and none afterward. After the trees are planted they are cultivated until a thorough dust mulch is established. This requires about five cultivations extending up into June when no more care is necessary until the rains of the next winter. In the following spring a mulch is again formed by stirring up the ground between the trees. After one year's growth many of the trees are ten feet in height with a diameter at the base of fully two inches. Trees set upon the same soil without cultivation have not equalled this growth in two years' time.

After the first year's planting was completed a nursery was established with a capacity of several hundred thousand trees a year for carrying on the work. The trees grown for the 1912 planting included about seven species of Eucalyptus and a few species of Acacias; numerous ornamental trees were also propagated for use along the drives and boulevards. Among these were a few thousand of the Torrey Pines (*Pinus Torreyana*), which were grown for enlarging the grove of these trees which is located upon the city land. With the exception of a few trees found upon one of the coast islands these are the only trees of this species in existence. About two hundred and fifty acres have been planted

during the spring of 1912, making three hundred acres now in trees. These trees will make a growth of about eight feet per year, and in three years' time should be of sufficient dimension to be available for fence posts. At this time the trees will be thinned, leaving not more than two hundred trees per acre to come to maturity as timber trees.

It was not until the active development of this land had been undertaken that its actual value for various usages was appreciated. It was seen that, lying as the greater portion does, with the mountains on one side and the Pacific on the other, with the rapid growth of the city this land would soon become reservable as sites for suburban homes. Many acres are also well adapted to intensive farming for the growing of small fruits and vegetables and could be subdivided and leased for this purpose to good advantage. A good portion of this agricultural land has been planted to grain for the use of the farm stock and that of the different departments of the city. For this reason it was decided to confine the planting to that portion of the land not so well suited to general agricultural or building purposes. As far as possible the planting will be confined to the canyons and hillsides, and the less valuable land. In planting on the steep canyon sides it is impossible to follow the method described, but as far as the land will permit the fullest pre-

paration will be given. Practically all the land so far planted is under cultivation.

The development of a Municipal Forest and Farm afforded a splendid opportunity for the city to take steps toward solving some of its most vexing social problems.

The idea first advanced was for the institution of a plant for sending the vagrants and habitual drunkards of the city to the farm on probation for a term of a few months; the drunks to first be given a drug cure to eliminate as far as possible the desire for drink. A camp was first established, however, mainly for relieving the unemployed of the city, although many have been sent from the Police Court. The men have been given employment, each at fifty cents per day and board. This plan has proven a complete success in every particular. Hundreds of men have been benefited by the clean, wholesome work afforded, and all the planting this spring has been done with this labor with good results. It is doubtful if a better plan could be devised for the solution of these problems in any city than the establishment of a Municipal Forest and Farm, and the employment of these men under such a plan. A Municipal Forest is a good business investment, and the useful employment of a class that has to be supported by the city directly or indirectly is also a good investment for the taxpayer.

LUMBERMEN HELP FORESTERS.

W. T. Cox, Minnesota state forester, reports that co-operation received from lumbermen in the northern part of the state has been such as to do away with forest fire dangers. He said that town officials and residents have also assisted. The heavy rains of the spring have done much to keep fires from starting in the woods.

FOREST PRODUCT STATISTICS.

The Forest Product Statistics of New York State for the year 1911, gathered by the Conservation Commission, show that the lumber and pulpwood output exceeded that of the preceding year, but that there was a falling off in wood used for alcohol, excelsior and cooperage.

The output of the forests in 1910 showed a decrease of 25 per cent from that of 1908; a decline of about 300,000,000 feet in three years. The annual removal of about one billion feet of wood material from the forests and woodlands of the state cannot go on indefinitely without reforestation on a large scale.

FIRST PURCHASE OF WHITE MOUNTAIN LANDS UNDER THE WEEKS LAW

THE purchase of 30,365 acres of land in the White Mountains of New Hampshire was authorized on June 19 by the National Forest Reservation Commission. The land is to be purchased under the Weeks Law which provides for the acquisition of lands by the Federal Government on the headwaters of navigable streams. A report previously rendered by the Geological Survey showed that these lands were of importance in protecting the flow of the Connecticut and Androscoggin Rivers.

The lands purchased include a tract of 29,570 acres at \$8 an acre, owned by the Berlin Timberland Company of Berlin, N. H., acreage to be determined by a horizontal survey to be made by the United States. The Commission also authorized the purchase of 795 acres belonging to Mrs. E. M. Libbey, of Littleton, N. H. This tract consists of an undivided interest in certain lots owned with the Berlin Timberland Company and forming a part of the tract purchased from that company.

The land purchased consists for the most part of valuable timber-producing lands on the north slopes of the Presidential Range. In addition to their value for their standing timber and for timber production they have other important advantages which make them among the most desirable of any in the White Mountains for the purposes of the Weeks Law. The tract has been carefully protected from fire for a number of years so that the ground where the mature timber was removed a number of years ago is now fully restocked with a good quality of young growth.

The nearness of all parts of the tract to the railroad adds materially to its advantages. Due in part to its nearness to railroads and in part to its natural scenery this tract is undoubtedly one of the best known of any in the White Mountains, containing many of the most prominent features of the vine, The Ravine of the Cascades, and

White Mountain region. Kings Ra-the Castellated Ridge are all on this tract, and it also affords many commanding views of the high peaks of the Presidential Range. During the past thirty years the Appalachian Mountain Club has developed a network of trails on the north slopes of this range, a greater portion being on this tract. Thousands of persons tramp these trails every year. It was considered by the Commission that in no other part of the White Mountains would the educational effect of a demonstration in forestry be so great.

The Connecticut River is by far the most important navigable stream originating in the White Mountains and three-fourths of this tract drains into that stream.

With the lands authorized for purchase at the meeting of the Commission a week previous authority has now been given for the acquisition of 72,000 acres in the White Mountains.

The land first purchased was what is known as the Bean Purchase, lying just east of the Carter Range and being the watershed of the Wild River. This comprised 33,800 acres at \$5 an acre and was the property of the Hastings Lumber Company, while 7,500 acres in Bethlehem and Franconia belonging to the Berlin Mills Company was bought at \$4 an acre. The Bean Purchase was swept by fire in 1903 and 9,000 acres damaged, but since then it has been well protected, and is considered by the Forest Service officials to be a valuable acquisition.

Options have been secured on 20,000 acres in Benton and Easton and Chief Forester Henry S. Graves left on June 20 to make a careful examination of them. He was joined by expert lumberman Eugene S. Bruce, of the Forest Service, a few days later. More or less other land has been offered and is desired, but the Forest Service officials consider that the price asked is too high.

FAVORABLE TO WHITE MOUNTAINS

OHAT the forest cover of the White Mountains has a distinct and measurable effect upon the navigable streams which head in that region is the unequivocal and emphatic statement of the United States Geological Survey. The Director of the Survey has filed his preliminary report on the White Mountains with the National Forest Reservation Commission, and, as earlier announced, the findings are favorable to the purchase of lands under the Weeks law.

The report of the Geological Survey is based on the results of exhaustive investigations and specific field tests which have been carried on during the last year. While the Survey has been subjected to frequent criticism and even bitter attacks, owing to its refusal to submit a perfunctory report assuming that a known and definite relation exists between forests and stream flow in the White Mountain region, the outcome of its investigations must not only satisfy the most radical forest enthusiast, but it precludes the possibility of criticism by those who have opposed the acquisition by the Government of any forest lands, on the theory that forest preservation does not affect stream flow. The investigations are believed, indeed, to solve definitely a problem that has long been a source of strenuous contention among scientists, including the friends of forest conservation, and while these investigations have direct reference to the entire White Mountain area, they establish a principle which is of far wider application.

The Weeks Forest Reservation Law places upon the Geological Survey the responsibility of establishing, before purchase, the fact that forest lands have an effect upon the navigability of navigable streams, and the law provides that the Survey shall make a field examination of every tract offered to the Government for sale thereunder. The Survey has insisted on following the plain mandate of the law and making such examinations, not at an office

desk but actually on the ground, in a thoroughgoing, scientific manner.

In the southern Appalachian Mountains tracts aggregating 1,962,800 acres have been certified to by the Geological Survey as affecting the navigability of streams by reason of the excessive erosion which follows deforestation in these areas. Owing to the geologic conditions in the White Mountains, no excessive erosion, according to the Survey geologists, can be shown to follow deforestation. Therefore the Survey carried forward its further investigation in the White Mountains along the lines of trying to show that deforestation and subsequent burning of the forest mulch results in a more rapid run-off and therefore tends to make unstable the flow of streams.

The hydrometric showing presented in the preliminary report covers results on two small, almost exactly similar drainage basins of about 5 square miles each, on the east branch of Pemigewasset River, one largely clothed with virgin timber and the other deforested and burned. The facts observed are so striking as to render the position of the Survey impregnable. Careful measurements of precipitation over the areas and of the run-off of the respective streams show that not only was the snow held better in the forested area, but that during a period of 17 days in April, including three extended storms, the run-off of the stream in the deforested area was a comparative flood—practically double that of the stream flowing through the forested area, as shown graphically below.

6.48 inches.
Run-off of Shoal Pond Brook (forested area) during three storms in April, 1912.

12.87 in.
Run-off of Burnt Brook (deforested area) during same storms.

Diagram comparing run-off from forested and deforested basins.

In the Shoal Pond Brook basin (the forested area) the Survey established

7 rain gages and 20 snow gages and the engineers visited these continually during the winter on snowshoes, the snow being from 4 to 7 feet deep; in the adjoining Burnt Brook basin (the deforested area) it established 9 rain gages and 18 snow gages. On both streams hydrometric stations were established and the stream flow determined with a high degree of accuracy. The Survey report shows that the maximum flood flow from the forested basin was only 67 per cent of that from the deforested basin.

During the period of these storms Burnt Brook (deforested) contributed a much greater volume of water to Pemigewasset River than did Shoal Pond Brook (forested). "The stream of the forested basin is observed to be the steeper of the two and in proportion to its drainage area it tends—at least during the spring months—to promote a steady flow of water in the master stream of which it is a tributary."

The conclusions of Director George Otis Smith, of the Survey, are as follows:

"The comparison between two adjacent basins during critical periods is presented in this preliminary statement as a sufficient showing for the purposes of the National Forest Reservation Commission. While data covering longer periods for both these and other basins in the White Mountains have been collected and will be available for the more complete report, the particular case of the Burnt Brook and Shoal Pond Brook basins is typical for the region and establishes the general conclusion that a direct relation exists between forest cover and stream regulation.

"The results of the Burnt Brook-Shoal Pond Brook studies are held to show that throughout the White Mountains the removal of forest growth must be expected to decrease the natural steadiness of dependent streams during the spring months at least.

"The foregoing conclusion forms a strong basis for arguing the desirability of painstaking methods of administration in respect to forest lands in the White Mountain region. Defores-

tation followed by fires, as in the Burnt Brook basin, results in conditions unfavorable to natural spring storage because conducive to rapid snow melting and stream run-off. Control of White Mountain lands that would reduce fires to a minimum and promote normal reforestation must result in a great improvement over present tendencies, and this improvement in forest cover can logically be expected to favorably affect stream regulation to the extent quantitatively indicated in the comparison of the forested Shoal Pond Brook with the deforested Burnt Brook.

"While the intensive hydrometric work was confined to a few headwater tributaries of the Connecticut and Merrimac rivers, the basins studied were selected as typical for the whole White Mountain area, and the field examinations over this region have shown the tracts now under consideration for purchase to be similar to the basins here reported upon. Therefore, the favorable showing of this report is of general application in the White Mountain area."

Such an actual demonstration and quantitative measure of the performance of different areas, some forested and others deforested, has never been attempted in trying to determine the effect of forest cover on stream flow. Efforts to arrive at definite conclusions have always been based on a study of long-time records of precipitation and stream discharge; but owing to the many qualifying factors, such efforts have simply resulted in divergent opinions and inconclusive controversies. The results of the present actual measurements in these mimic drainage basins, so accurate and refined in method as to approach laboratory experiments, where exact results may be expected, leave no doubt as to the conclusion. Forest cover and the resulting forest mat in the White Mountain granite area does, to a considerable and measurable degree, steady and regulate stream flow, and therefore must be stated as an important factor in maintaining the navigability of streams whose headwaters lie in such areas.

RAISING ELK AND DEER

MUCH interest has been manifested by readers of AMERICAN FORESTRY in an article on Raising Deer on Forest Preserves and a number of inquiries have been received regarding cost, method of feeding, etc.

The following extracts from a letter by Howard Eaton, a dealer in wild animals, of Wolf, Wyoming, to Wm. M. Ellicott, of Baltimore, who worked for the passage of the bill by the Maryland legislature allowing the raising of deer for the market, gives many interesting details in reference to elk and deer raising.

Mr. Eaton says:

"You have done the right thing for Maryland in this deer and elk breeding matter, and it solves the question of how to use the cut over and bushy country which is not suitable for farming and hardly carries enough feed to fatten cattle, etc.

"I have shipped elk all over the U. S. and delivered a lot to Mrs. T. M. Carnegie, Cumberland Island, Fla. These elk did well as far as climate and altitude went, but were killed by some poison plant. Near N. O. I sold a lot and five years later heard that they had done very well.

"Mosquitos would not injure the elk or deer, as they have served their time with skeeters in Montana, Wyoming, etc.

"I can't remember altitude of Lake Superior, but a large lot of deer and elk are right along the shore, virtually at water level.

"Elk will browse and also graze. I've never known elk subject to any disease, except that in the Yellowstone Park some years since and many elk died of mange, much like the old buffalo mange, but I've not heard of any mange there since winter of 1902-3.

"I'd advise 8 ft. fence, although lower ones might answer, but the 8 ft. fences (Page woven wire is O. K.), would hold the elk and by stretching a wire 1 ft. above it would hold deer as well. The 8 ft. fence would hold antelope, elk, moose and buffalo.

"In Maryland, I'd consider shelter unnecessary, although you would or should have feed corrals or pastures, where game could be fed some in winter, making it tamer and allowing a count and view of the animals.

"Let the buffalo run all the year with the cows.

"Elk will kill dogs or run them out of pasture, especially when the elk calves are around. I saw a bunch of them corner a big Canada lynx and he was one of the worst scared animals I ever saw,—only saved his life by climbing a tree.

"You would not need goats with the elk.

"No special training is required to handle elk,—just good wild hog sense. If feeding hay at any time remember that elk and deer prefer weedy hay to clear timothy or alfalfa.

"In a small enclosure during rutting season, the bulls are dangerous—same as male deer at that season, but in a large park the elk will keep away from a man.

"A man on a horse would be immune from bulls, unless during the rut, he would corner an old fellow.

"The meat of the bulls is best out here up to about October 1st, although at times a bull will rut in September, by 15th to 20th.

"Cows are good at any time when in flesh—same as our domestic cattle. Bulls are good meat when they regain flesh after their horns are shed (usually in March this happens).

"I've never hesitated to go among the elk freely, afoot or in saddle, at any time except rutting season, but while it might be and is as a rule, safe to feed them salt from the hand, yet it is unwise to trust any mature wild animal—he seems to get locoed at times. I'll write Mr. Knorr and urge that the Agricultural Department co-operate with the Maryland Agricultural Station and try game raising, but you know that the Government is mighty slow at times. I have urged many times that the game be placed on cut over

lands of low value in Maryland, Virginia, West Virginia, and Pennsylvania.

"It is a great chance to make money easily. I have a friend in Iowa who kills his deer and tags them with a special permit, ships to Chicago, and nets about \$30 for does and \$35 for bucks. These animals cost him very little more than to raise a couple of

sheep—his income from deer in an 80-acre pasture is \$1,000 to \$1,100 per year for venison and \$300 to \$500 per year from sale of live animals.

"Except to feed in winter and to dress the meat, there is no work in raising and selling these deer.

"I've had nearly 40 years' experience in raising and selling wild animals and am fairly well posted.

A DEMONSTRATION FOREST

THE Board of Regents of the University of Washington, at their meeting April 24, on the recommendation of President Kane unanimously authorized the College of Forestry to co-operate with the United States Forest Service in the establishment and operation of a demonstration forest.

The College of Forestry has long felt the need of such a forest. While the general conditions about Seattle are perhaps better adapted for carrying out student exercises and demonstrations by the instructor than they are at any other school in the country, yet there are many problems that cannot be worked out successfully except on an area fully controlled by the College. Although this forest will be subject to the control of the United States Forest Service and a tract owned by the University would in some respects be more desirable this forest will open the way for the solution of many problems.

The object of the demonstration forest is two-fold. First. It will be used as an experiment station. The field of work in this line that is open in the Pacific Northwest is practically unlimited and the various problems to be solved have hardly been touched upon. Abroad forest experiment stations are common and they have contributed largely to the development and advancement of forestry. With the decrease in the available timber supply and the increasing interest that lumbermen and timberland owners are showing in reforestation, the general public is demanding information on the

best methods of handling forest lands for increased and continued production. It is one of the objects to use the forest to carry on experiments that will lead to a solution of these problems.

The second object of the demonstration forest is to make it serve as a field laboratory where the students in forestry may acquire at first hand a practical knowledge of all phases of forestry and lumbering. This is of especial importance to the students who elect the course in logging engineering. This course combines a knowledge of forestry and logging in such a manner that it will enable the student, after a period of apprenticeship, to take charge of logging operations.

The site for the forest will probably be selected during the coming summer. An entire water-shed readily accessible to the University will be chosen. When the work is put under way the students will be required to make a complete working plan, including a detailed cruise, topographic and forest type maps, valuation of timber, plan of logging, improvements, and tables showing growth and yield. All cutting will be done in accordance with the working plan in such manner that the operations are financially successful and at the same time that future yields will be increased and the forest generally improved. The details of all proposed plans will be subject to approval by the National Forest Service. All timber sales will be made in accordance with Forest Service regulations and the revenues therefrom will be entirely under government control.

THE FORESTRY CONFERENCE IN THE WHITE MOUNTAINS

THE program for the Fifth Annual Forestry Conference in the White Mountains, July 17-19, presents a number of interesting features. It is held under the auspices of the Society for the Protection of New Hampshire Forests, in co-operation with the New Hampshire Forestry Commission, and includes meetings of the Directors of the American Forestry Association, the North-Eastern Foresters, and the New Hampshire Timberland Owners Association. An outline of the program shows the excursions and visits to forest enterprises, and the subjects for discussion:

July 17, 10 a. m. Meeting at the Deer Park Hotel, North Woodstock. A visit will be made to the famous Lost River, which has recently been acquired by the Society for the protection of New Hampshire Forests, with 148 acres of timberland adjoining.

8 p. m. A meeting at the Deer Park Hotel, North Woodstock. Ex-Governor Rollins will preside. Addresses are expected from Governor Bass, of New Hampshire, President of the American Forestry Association, and Governor Plaisted, of Maine. Mr. W. R. Brown, Chairman of the State Forestry Commission, will outline the forest work in New Hampshire, followed by brief remarks by the State Foresters and other official representatives from the several New England States.

July 18. At Bretton Woods. 2 p. m. The Mt. Pleasant House. A meeting for the discussion of measures to prevent forest fires. Mr. W. R. Brown will preside. Brief papers will be presented from a number of persons who

have actually had experience in fighting fires. Mr. J. G. Peters will speak upon the co-operation of the federal government.

8 p. m. The Mt. Pleasant House. General conference upon conditions in the White Mountains. It is expected that members of the National Forest Reservation Commission will be present, together with representatives from the Forest Service and the Geological Survey. New Hampshire's purchase of the Crawford Notch. Experts have been invited to discuss the influence of the forest upon the flow of streams.

July 19. 9 a. m. The Mt. Pleasant House. Eleventh annual meeting of the Society for the Protection of New Hampshire Forests.

10 a. m. General conference upon forest taxation. Leaders in this discussion will be, Dr. B. E. Farnow, of Toronto, Professor Fred R. Fairchild of Yale, and Professor Charles J. Bullock, of Harvard, and the Foresters from the several States.

2:30 p. m. The Crawford House. A porch talk on the Crawford Notch purchase, followed by a walking trip into the primeval spruce timber on Mt. Webster.

Members of the conference will visit the State Forest Nursery at Boscowen, N. H. Headquarters for the conference will be at the Mt. Pleasant House, Bretton Woods, which makes a special rate of \$3.00 per day. The same rate to members of the conference is made by the Deer Park Hotel, and the Crawford House. The Mt. Washington Hotel also offers special rates.

CHINA'S MOST VALUABLE WOOD.

The nammu tree (*Persea nam-mu* Oliver) of the laurel family of plants yields the most valuable wood of China. It grows in the moist climate of western Szechuan, China, which lies between the 25th and 26th degrees north latitude. This is in about the latitude of New Orleans and attempts are now being made to grow this valuable tree in this country.

STATE FOREST PROBLEMS IN MARYLAND

By F. W. BESLEY, *State Forester*

NOT many years ago the Federal Government was practically the only agency for organized forestry work in this country. Since then, however, not less than twenty-seven States have taken up the practice of forestry in a more or less systematic way and are at the present time expending over a million dollars annually in the effort.

When we recall the many years of hard fighting by a few men whose names are familiar to all of you, that was required to establish a forest policy for the Government upon the millions of acres that the Government owned, it is not surprising that the States have been unseemingly slow in adopting a forest policy which involved lands owned by private individuals who have little or no interest in this general problem of forest conservation. Herein lies one of the chief difficulties and accounts in a large measure for the slow development of forestry in the states. Few states have large holdings of forest land upon which they are free to practice forestry without restriction. Practically all of the land is held by private individuals who can only be appealed to by showing them that the practice of conservative forestry will pay and in face of the fire risk, the low value of stumpage, the hap-hazard system of taxation, and lack of reliable data as to what may be financially expected, this is difficult to figure out to the satisfaction of the landowner. At the same time the landowner will continue to hold his land in timber growth, and is generally willing to adopt means for greater protection and measures to improve growth conditions when such improvement does not involve much of an outlay. This opens up a wide field of usefulness which the state can, and does, supply and which means real progress even though it be far from the ideal we hope to attain eventually.

Organized forest work began in Maryland in 1906 through the activities

of a few people, who succeeded in securing the necessary legislation to establish it, and did not come because there was a demand for it on the part of the people at large. It started in an inconspicuous way, with a small appropriation, too small in fact to attract the notice of the politicians. Like many other states the promoters of the forest movement in Maryland had the cooperation of the United States Forest Service which offered a model law, that, with a number of modifications to suit the circumstances, was adopted. One of the good features of the law was the provision relating to a non-partisan State Board of Forestry, consisting of the Governor, the Comptroller, the president of the Johns Hopkins University, the president of the State Agricultural College and two appointees of the Governor, one of whom shall be a citizen of the State interested in the advancement of forestry and the other a practical lumberman, engaged in the manufacture of lumber within the state. Notwithstanding the fact that Maryland has the reputation of great political activity within her state boards, the Board of Forestry has been entirely free from it, and ever since the work was organized there has been absolutely no political interference and it is not believed that with an ex-officio board of this character, such a thing is probable. The forest law has been amended in two or three particulars, but in the main it stands to-day as representing nearly everything that is needed from the standpoint of legislation, and its successful working has prompted other states to adopt many of its provisions. Forestry in Maryland has a promising field and while progress has been slow, a substantial foundation has been laid which will enable the state to proceed in the development of a forest policy along constructive lines. The first appropriation was \$7,000 for the two years 1907-1908; \$8,000 for the two following years; \$9,000 for the next two years



GOOD SPECIMENS OF FOREST GROWN WHITE OAKS, KENT COUNTY.

and for the years 1913 and 1914 the sum of \$84,500 becomes available. It should be added that \$58,500 of the last biennial appropriation is for the purchase of lands, leaving \$26,000 for maintenance and publications.

State work is necessarily of an extensive character, rather than intensive. The position of Maryland is perhaps unique in the great variety of natural conditions that exist within her borders. From the extreme southeastern to the extreme northwestern corners of the State is practically 265 miles in a straight line and between these two extremities are found as great a variety of soil conditions, tree species, and forest types, as can probably be found in any state. This gives a diversity of conditions that is not usually found elsewhere. In the extreme southeastern part of the State are pure stands of red gum, cypress and loblolly pine, such as are common to the south; while in the extreme western part, in the mountain region, the white pine, tamarack, hemlock, spruce, yellow birch, sugar maple and other trees of the northern type are found. Between these extremes is a variety of hard-

woods that would be difficult to duplicate in any other equal area in the United States. Likewise this field presents nearly every form and degree of forestry from the worst kind of mismanagement to the most intensive form. In the central part of the State where the best agricultural soils are found, the woodlands are confined, as a rule to relatively small woodlots, receiving in most cases fairly intense forest management under the selection system. In the southeastern part of the State, where pure stands of loblolly pine are found, the form of management approaches the clear cutting system. Southern Maryland is a section in which large areas, that were formerly cultivated, prior to the Civil War, are now grown up in pines and hardwoods. In the mountain forests of the western section, destructive methods of lumbering and severe forest fires afford excellent examples of what to avoid in the practice of forestry. There are two million acres of woodland in the State, which represents 35% of the total land area, so that according to the ideal arrangement in an agricultural state, the per-



A HEAVY SECOND GROWTH STAND OF LOBLOLLY PINE, SUCH AS IS FREQUENTLY SEEN IN THE LOWER EASTERN SHORE PENINSULA OF MARYLAND.

cent of woodland is still in excess of local needs. It is estimated that 20% of the total land area is better adapted to a forest growth than for cultivation or pasture, and it is not likely that the woodland will ever be reduced below this percentage. Probably 95% of the woodlands are in small holdings, ranging from 5 to 1,000 acres, so that it is difficult to get organized co-operation in fire protection, because of the large number of owners involved.

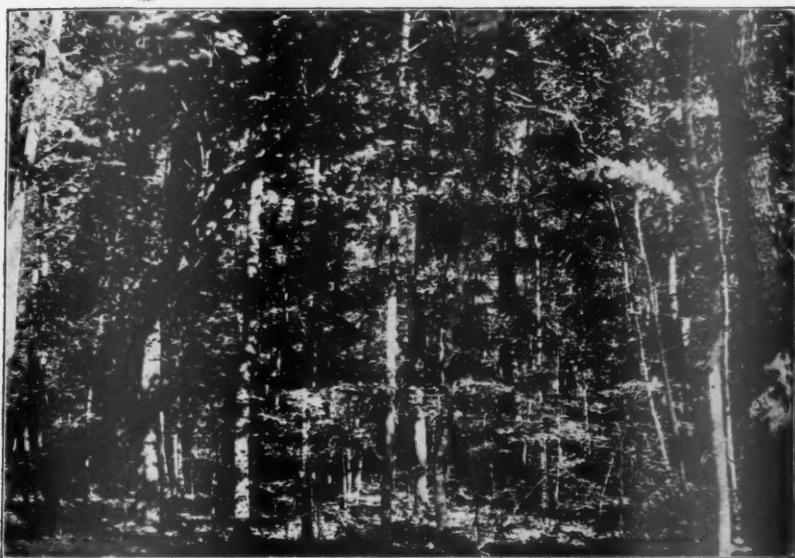
Naturally under the diversity of conditions that have been indicated, the forest problems of even a small State like Maryland are many and varied. What is true of Maryland is also applicable in most of the eastern states.

The main forest problems in Maryland may be classed under: Investigation of forest conditions; Educational work; Co-operation with landowners; The control of forest fires; Acquisition and care of State Forests.

INVESTIGATION.

Before any State can adopt an intelligent forest policy there is the need of reliable information concerning its

forest resources. This has been secured by the different states in various ways and in a more or less approximate manner. The first work done in Maryland was the beginning of a forest survey, by counties, in which all the woodlands were plotted on base maps, drawn on a scale of 1 mile to the inch. All woodlots of 5 acres or more were located as accurately as possible and classified as to character and condition, as nearly as could be done by a superficial examination in driving over the public, and many of the private, roads. This work has been continued from 1906, until the present time, when the survey of the State has been completed, with the exception of one county. In addition to the forest map of each county, a large amount of information was obtained as to forest fires, suitable methods of forest management, timber production and uses, market conditions, transportation facilities, the forest fire sentiment in the communities, etc. This first-hand information has enabled the Forester to become intimately acquainted with all sections of the State and the various conditions that are presented; the



A DENSE YOUNG STAND OF MIXED HARDWOODS IN NEED OF AN IMPROVEMENT CUTTING.

results of these studies being published in the form of county reports, a number of which will appear during the coming winter as an appropriation of \$6,000 has just been made available for this purpose.

Further investigations are being made as to the rate of growth of the important timber trees and other studies in anticipation of future needs. The idea is to have in the possession of the State such complete information as will enable the forest officials to meet the various questions that are constantly coming up in an intelligent manner, and without delay. Maryland has placed more emphasis upon this feature perhaps than other States, but to us it seems fundamental and I believe will be fully justified.

If forestry is to succeed fully, it must be presented in a popular manner, so that its principles shall become household words, so to speak. To accomplish this necessitates the use of every available means by which it may be introduced to all classes of people. It is primarily a campaign of education that must be conducted for many years to come. It is particularly important in the beginning. The educational feature of the work takes various

forms as for example, lectures before various organizations, miscellaneous gatherings, in fact any places or occasions where an audience is provided. This will naturally take a wide range possibly from a woman's sewing circle to a legislative assembly. The most effective work is done with Farmers Institutes, Farmers Clubs and Granges, because in such meetings there is the direct contact with the progressive woodlot owner. Forestry exhibits at the county fair and other exhibitions is an effective method of reaching many people. Publications bearing on various forestry subjects and calculated to meet specific needs are also an effective means of education. The Maryland law provides for a course of lectures on forestry at the State Agricultural College which as supplementary education along agricultural lines is productive of good results. The plan of keeping the newspapers supplied with material that they will publish is another educational feature and not to be slighted. In all of the educational work, the important thing is to reach the individual landowner who has it in his own hands to promote or hinder the real progress of forestry and to do this is one of the most difficult



A PASTURED WOODLOT SHOWING POOR SOIL COVER AND ABSENCE OF YOUNG GROWTH, DUE TO OVER-GRAZING.

problems of State forest work. After all the means enumerated have been used to the limit, people will be found who have never heard that there was a State Forest Organization.

The plan of examining woodlands upon application and giving advice to the owners has been carried on in Maryland, as in other States. Since the adoption of this plan about 28,000 acres of woodland have been examined and advice given as to its management. These areas are widely scattered over the State and each serves in a way as an object lesson of practical forestry applied in a manner to meet the needs of the individual case. This work has been supplemented by the establishment of five demonstration forests in as many different counties for the purpose of carrying out in a more definite way certain plans of forest management. These demonstration forests belong to private landowners who have agreed to manage them under the direction of the State Forester. In this way the State can offer demonstrations of applied forestry without having to acquire the land and so far the plan has worked very satisfactorily.

One of the easiest ways to interest the average landowner in forestry is to

get him started along the lines of tree planting. Trees grown in a State Forest nursery and sold to him at cost is an inducement. The demand for such stock is usually much greater than the supply. In this way a man may be perfectly willing to plant trees on good agricultural land, when under the most favorable conditions no profit can be reasonably expected, while he may have a hundred acres of burned over mismanaged woodland, which if protected properly and managed would increase the yield to three or four times what he now receives. As a purely business proposition much of the private planting that is done is open to serious question, but inasmuch as the landowner insists upon doing it and it really advances the interest in forestry the State is not without justification in encouraging the enterprise. At any rate forest planting in the east, or elsewhere, under certain conditions is a good thing and if we as foresters encourage the would-be planter to restrict his planting to locations where fire protection can be assured and to soils not suitable for more remunerative crops, and to trees of rapid growth and early maturity, no permanent harm will be done to the individual or to the reputation of the forester.



A ROADWAY THROUGH A MARYLAND FOREST.

The control of forest fires is the most important problem in Maryland, as is apparently the case in all of the other States. It is reasonably certain that if forest fires in the mountains could be controlled within reasonable limits, the timber production of that section would be at least doubled. Without such fire control conservative forest management is out of the question.

There are some sections in the State where forest fires are infrequent, such as the southern portion. In other places, such as the central part where the forest lands are generally isolated woodlots, fires are frequent but never so destructive because they are usually confined to relatively small areas. The annual loss from forest fires is about \$100,000, the bulk of which is in the three western mountain counties. The forest laws are adequate to deal with the forest fire situation and now that we have secured increased appropriations for the purpose, it is believed that a fairly effective system may be established. The system now in operation is that of local forest wardens, forest patrolmen and lookout watchmen. All of these men are commissioned as forest wardens by the Governor, upon recommendation of the State Forester. The law limits the number of wardens

in each county to one for each 15,000 acres of woodland or majority fraction thereof. The wardens are under the control of the State Forester and are paid for services rendered at the rate of 25c. per hour, the county and State sharing equally in the expense. The wardens have the authority to employ assistance, arrest without warrant, the power to summon help in case of emergency, and in fact, they are given full authority to deal with forest fires and the enforcement of all forest laws. The forest patrolmen are employed under the co-operative arrangement provided in the Weeks Law, the State putting up \$1,200, which amount has been duplicated by the Federal Government to pay the expenses of the patrol work. This amount will be more than doubled for the next year.

STATE FOREST RESERVATIONS.

As a general policy the acquisition by the State of large forest areas is open to question. To my mind there are but three legitimate objects to be considered in such purchases.

1. Mountain lands, which have a high value for water conservation in state streams, in addition to timber production and upon which the present or

prospective owners cannot afford to practice conservative forest management because of economic conditions.

2. Small areas distributed over the state to serve as demonstrations of practical forest management.

3. Lands of special value for State parks, or watershed protection.

Maryland owns less than 2,000 acres of State Forests located in the mountain section and which may be classed under number 1 above. These came to us by gift at the time the first forest law was enacted. The five demonstration forests under State supervision, but privately owned, served as the second class of State Forests; while the third will be represented in the Patapsco Park, near Baltimore, for the pur-

chase of which \$50,000 has recently been appropriated by the State.

These are only a few of the more important problems with which the State has to deal. Many others are awaiting solution, such as the taxation of woodlands, the problem of forest tree insects, and diseases, the encouragement of wood-using industries that will utilize low grade material and make forest management more profitable, the protection of shade and roadside trees, and new ones constantly asserting themselves as new conditions are presented.

*Photographs by courtesy of the Maryland State Board of Forestry.

AMERICAN FORESTRY ASSOCIATION DIRECTORS MEETING

THE midsummer meeting of the directors of the American Forestry Association will be held in the White Mountains, in connection with a trip on July 17, 18 and 19, arranged by a joint invitation extended to them and their guests by Governor Bass, of New Hampshire, the president of the American Forestry Association; the New Hampshire Forestry Commission and the Society for the Protection of New Hampshire Forests.

The following itinerary has been arranged for all those starting from New York, but it is desired that if it is more convenient for others to join the party at some point en route that they may feel free to do so. If sufficient acceptances to the invitations are received a special Pullman car will be attached to the regular 8 p. m. train for Concord, N. H., at the Grand Central Station, New York, on Tuesday evening, July 16, which will be sidetracked at Concord on Wednesday morning.

The party will breakfast Wednesday, July 17, at the Eagle Hotel and Governor Bass will then receive and welcome the party at the State Capitol. Automobiles will be furnished through the courtesy of a number of those in attendance and an automobile truck to carry all baggage. A run will then be

made of about seventy-five miles to Deer Park Hotel at North Woodstock stopping on the way to see the State Nursery at Boscowan and to lunch at Plymouth. At Deer Park Hotel the party will join members of the Society for the Protection of New Hampshire Forests in a short visit to the most beautiful Lost River Reserve nearby, lately purchased by the Society, returning to the Hotel for dinner and the night. The morning of Thursday, July 18, the party will proceed by automobile through the profile notch to the Mt. Washington Hotel, Bretton Woods, for lunch and remain there in attendance upon the fifth annual forestry conference which is to be held at Bretton Woods on the 18th and 19th under the auspices of the Society for the Protection of New Hampshire Forests in co-operation with the State Forestry Commission and the Association of North Eastern Foresters. Short excursions from this point can easily be taken to see the New State Reservation of Crawford Notch and the proposed Federal Reserves to be purchased under the Weeks Act. The special Pullman will be brought from Concord to Bretton Woods for those returning to New York and leave at about 8:30 a. m., July 20, and arrive in New York at about 9 p. m.

THE NEW YORK STATE COLLEGE OF FORESTRY AT SYRACUSE UNIVERSITY

ON July 28, 1911, the act establishing the New York State College of Forestry at Syracuse University became a law through the signature of Governor Dix. The objects and purposes of the College as stated in its organic law are:

1. The conduct upon land acquired for such purposes of such experiments in Forestry and Reforestation as the Board of Trustees deem most advantageous to the interests of the State and the advancement of the Science of Forestry.

2. The planting, raising, cutting and selling of trees and timber at such times, of such species and quantities as the Board of Trustees deems best, with a view of obtaining and imparting knowledge concerning the scientific management and use of forests, their regulation and administration, and the production, harvesting and reproduction of wood crops and the earning of a revenue therefrom.

The College is directly under the control of a Board of Trustees, partly designated by the Act of Organization, partly appointed by the Governor and partly elected by the Trustees of Syracuse University.

New York was one of the first States to realize the necessity of training young men as foresters. In 1898 the State Legislature established a State College of Forestry at Cornell University and gave to the College a tract of 30,000 acres in the Adirondacks to be used as a demonstration forest. Owing to an unfortunate combination of circumstances arising in the management of the demonstration forest at Axtion, the College was closed in 1902 after four very successful years under Dr. B. E. Fernow, now Dean of the Faculty of Forestry at Toronto University. In view of the tremendous interest in every phase of forestry in the State evidenced by a constant demand from all classes of people for more information as to the reforestation of waste lands and the

best methods of caring for what we still have, the State College of Forestry was re-established and located at Syracuse University because of the easy accessibility from all parts of the State, nearness to the Adirondacks, and because of splendid facilities offered students in forestry for work in other colleges of the university in engineering and the natural sciences.

Those who framed the organic law of the College saw clearly that such an institution should serve the State in more than instructional work in forestry only and obligated the College to carry on two definite and equally important lines of work: The carrying on of such research and investigative work in forestry as will aid in the solution of the many problems which confront the people and the State of New York in the protection, care and extension of that increasingly valuable asset of the State—the forests of the Adirondacks and the Catskills, and in the practical reforestation of the millions of acres of waste lands in the State which are adapted to a forest crop only. Second, the giving of instruction in forestry, not only for students who may be attending the professional courses in the College or the practical ranger course, but for anyone else in the State who wishes to know more as to the care of their trees, the planting of waste lands so that such lands may become a profit and not a loss; the cutting of timber so that another crop may be obtained; the treatment of timber so as to prevent decay, and general facts as to our trees and forests and the animals and plants which help or injure them.

A FOREST EXPERIMENT STATION

To be able to carry on effectively such research and investigative work as will be of immediate help in the State, the Legislature stated in its act that \$40,000 of the initial appropriation for the College of Forestry should be used

for the purchase of land. Early in April a tract of 90 acres, made up of two small farms and their buildings, and lying just beyond the south boundary of the city on one of the main trolley lines, was purchased and is known as "The Forest Experiment Station of the New York State College of Forestry." The land was selected because of accessibility from the city and the University; because of great diversity of soil conditions and because of a living stream of water which can be made easily available over the entire tract. Some 30 acres is covered with woodlot made up largely of maple, oak, hickory and other hardwoods, but containing an unusual amount of volunteer seedling growth of pine, hemlock and *arborvitæ*. During the present spring over 450,000 seedlings of conifers will be put into transplant beds for use in experimental work in reforestation of waste lands. A hundred seed beds will be planted with seed of a large number of species, but mostly of conifers. Several lines of experimental work are being organized, some of which will be carried on in co-operation with the State Conservation Commission, the Department of Forestry of the State College of Agriculture at Cornell and with other forest interests of the State.

PROFESSIONAL TRAINING IN FORESTRY

A four-year technical course leading to a degree of Bachelor of Science in Forestry will be given. Upon completion of a fifth year in the College and a period of satisfactory practice, the graduates of this College will be granted the degree of Master of Forestry. For graduates of Syracuse University or other institutions of similar rank, whose undergraduate work has not had special reference to technical forestry, two years of work in the College will be required for the Master's degree.

THE RANGER SCHOOL

The increasing demand for men trained in the woods and understanding the elementary principles of Forestry has led the college to establish a ranger

school to be known as the "New York State Ranger School." An intensely practical course of two years will be given, which it is believed will prepare men in a splendid way for work as forest rangers, forest guards, forest estate managers, nursery foremen and tree planting experts. Two thousand acres lying along Cranberry Lake in the Adirondacks has been offered to the College for its Ranger School and it is planned to give nearly all the work of the School in the woods. During a portion of each year, instructors will be at the School to give work in Mathematics and Engineering, Botany, Soils and Geology, Zoology and Entomology and related lines. Practical woodsmen and lumbermen will be brought in for special instruction. It will be the constant aim of the College to turn out men from the Ranger School who will understand the forests and their care and what they mean to the State, and who will be as practical in the woods as training of such length can make them.

WHERE THE COLLEGE WILL WORK.

For the present, the State College of Forestry is located in the new Natural Science Building of the University, Lyman Hall. Laboratories are being equipped for work in Dendrology and Wood Technology. The Forest Experiment Station will be used for instructional work in Seeding and Planting and Nursery Practice. Some \$8,000 of the present year's State appropriation for the College will be spent during the coming summer for a range of greenhouses and potting and seed storage rooms for winter work in Nursery Practice and for experimental work in Silviculture, Forest Pathology and Entomology. A Forestry library for the College has been begun and an effort will be made to make this library unusually complete and accessible, that it may become especially valuable to those wishing to do research work along any phase of Forestry. A very large room has been assigned the College for a Forestry Museum. Collections will be made to show economic relations and



Photo by Hugh P. Baker.

LYMAN HALL OF SCIENCE, THE HOME OF THE NEW YORK STATE COLLEGE OF FORESTRY AT SYRACUSE UNIVERSITY. THE COLLEGE HAS AMPLE QUARTERS IN THIS NEW BUILDING.

developments and for their instructional value.

The College, through numerous trolley and steam lines running in every direction from Syracuse, has easy access to a wide territory in which there are unusual examples of different forest floras, forest conditions, and logging and lumbering operations. In its nearness to the Adirondack forest, where the Conservation Commission is doing such splendid work in reforestation, of extensive areas of waste lands where reforestation is greatly needed, and large logging and manufacturing operations, there is no more strategic center anywhere in respect to the solving of forestry problems, than that of the New York State College of Forestry.

THE TEACHING STAFF OF THE COLLEGE

That the preliminary work of organization might be begun at once and that

arrangements might be made for instructional work during 1911-12, the Board of Trustees appointed Dr. William L. Bray, Chief of the Department of Botany in the University, as Acting Dean of the College. Dr. Bray has not only had an unusually strong training in Botany, but for several years carried on investigational work in Western Texas in co-operation with the United States Forest Service, which resulted in the publication of valuable reports on forest conditions in our Southwest.

In February, 1912, Dr. Hugh P. Baker was elected to the position of Dean of the College of Forestry, and he entered upon the work on the first of April. Dr. Baker has a Bachelor's Degree from the Michigan Agricultural College, a degree of Master of Forestry from the Yale Forest School and in 1910, after a residence of one and one-half years in Germany, received the degree of Doctor of Economics from



Photo by Hugh P. Baker.

THE VALLEY FARM OF THE FOREST EXPERIMENT STATION OF THE NEW YORK STATE COLLEGE OF FORESTRY. OVER 150,000 SEEDLINGS WILL BE PUT INTO TRANSPLANT BEDS ON THIS AREA AND 100 SEED BEDS PLANTED WITH SEED FOR BOTH CONIFERS AND HARDWOODS.

the University of Munich. He entered the then Division of Forestry in 1901, and for ten years was continuously connected with scientific and practical work in the Government Service. In 1904 he took charge of Forestry at the Iowa State College, developing the work there, and in 1907 took charge of the Department of Forestry at the Pennsylvania State College.

In the fall of 1911, to meet immediate need for instructional work in Forestry, Mr. E. E. McCarthy, a graduate of the Forest School at Ann Arbor, came to the College as Assistant Professor of Forestry, and during the past year has been giving courses in Dendrology, Mensuration and Silviculture. He remains at the College under the newer organization and will have charge of the work in Dendrology and Wood Technology.

Mr. John W. Stephen, who was graduated from the Forest School of the University of Michigan and who

spent two years in charge of State Forest Lands in Northern Michigan, came to the State Conservation Commission in 1908, as a Forester and developed the extensive State Nursery at Salamanca. He took up work with the College on April 15th, as Assistant Professor of Silviculture, and will have direct charge of the Forest Nursery being developed at the Forest Experiment Station, and will develop during the coming spring a demonstration planting on the State Fair Grounds. He will have charge also of such extension work as the College does in reforestation of waste lands in the State.

Professor Frank F. Moon, who has been in charge of the work in Forestry at the Massachusetts Agricultural College for the past two years, and who will spend the coming summer in Germany, comes to the College in September as Professor of Forest Engineering. He will have charge of the work in Forest Mensuration and Engineering,



CUTTING DOWN CHESTNUT TREES AT SOUND BEACH.

and will carry on work in Forest Mapping in co-operation with the State Conservation Commission.

Professor Nelson C. Brown, who is now connected with the Department of Horticulture and Forestry at the Iowa State College, and who was formerly Deputy Forest Supervisor of the Deer-ledge National Forest in Montana, comes to the College on the first of July as Assistant Professor of Lumbering.

Professor Brown, who is a graduate of Yale College and the Yale Forest School, has had very unusual practical training in Forestry, and will have entire charge of the courses in Lumbering, Forest Utilization and related lines. During the coming summer he will make a study of logging and manufacturing operations in Northern New York, to gather material for his work in the College and for publication.

THE CHESTNUT TREES GOING

CEVERY student and lover of human nature has mourned on account of the sickness and death of the chestnut trees, says *The Guide to Nature*. The chestnut trees are our special friends of the forest and around them are particularly pleasant memories of the time, when in our youth, we gathered their fruit. In their flowering and fruiting they are of great interest in later biological studies. A more graceful shade tree never existed. They have been tried and found true from our childhood to our old age. They have been valuable in our poetry, our pathos and our commerce. But even the most skilled scientists have not been able to cope with the ravages of the terrible fungus disease which

attacks the trees after the fungi hide themselves under the bark. The sooner such trees are cut down the better, for with no host tree on which to feed and propagate, perhaps the chestnut disease will die out, and we may hope that our grandchildren will gather nuts and tell their grandchildren of their nutting excursions, and of the squirrels with which they shared their spoils.

In South Beach, Conn., not far from our Arcadia, is a grove as primitive as when Keofferman, or Mianus, or Cos Cob, led his warriors to battle. To this grove, commonly known as the Miller woods, have come the lovers, the saunterers, the picnic parties, the botanists and the ornithologists, and to it have come, as to an entomological



DRAWING THE CHESTNUT LOGS TO THE SAWMILL.



THE STEAM SAWMILL CUTTING UP THE CHESTNUT LOGS.



DRAWING THE LUMBER OUT OF THE WOODS.

Mecca, the expert collecting entomologists from the American Museum of

Natural History of New York City. The grove is rich in everything that is good from an inspirational and educational aspect, and everyone who has known these beautiful woods will regret the loss of the stately chestnut trees that only a few years ago were so thrifty.

But the owner is doing the right thing. He is removing them as speedily and as skillfully as possible. This is being done under the management of Contractor Hawks, with his sub contractor Bailey, of the portable sawmill. While the saw mill has been in action hundreds of visitors have been attracted to the place because here logging has been carried on in as picturesque and as skilled a manner as it is in the primitive forests of northern New England. One can hardly realize in looking at the accompanying illustrations that these scenes are only a short distance from modern residences, a railroad and a trolley car track.



SOON THE CHESTNUT BLOOM WILL BE RARER THAN THE RAREST ORCHIDS.

Photographs by courtesy of *The Guide to Nature*.

TO FIGHT FOREST FIRES.

Twenty-five miles of telephone lines have been constructed this spring by the Coeur d'Alene Timber Protective Association, and an additional 25 miles will be constructed before the fire danger season is at its height.

LUMBERING AND FORESTRY

WORK OF THE INTERNATIONAL PAPER COMPANY AND CHAMPLAIN REALTY COMPANY IN FORESTRY IN CONNECTION WITH THEIR LUMBERING OPERATIONS IN NEW HAMPSHIRE AND VERMONT *

BY GEORGE A. CHEDEL, *Superintendent*

CHE acreage of timberlands owned by the International Paper Company and its subsidiary Company, the Champlain Realty Company, in New Hampshire and Vermont States is 147,085 acres of which 79,723 acres are in Vermont and 67,362 acres in New Hampshire.

The average consumption of spruce wood in the mills of the International Paper Company in this division, under normal conditions, is 45,000 cords per year. During the thirteen years which the International Paper Company has been cutting, or since its formation, there has been cut on the lands in this division approximately 312,000 cords, or an average of about 24,000 cords per year, or less than two-tenths of a cord

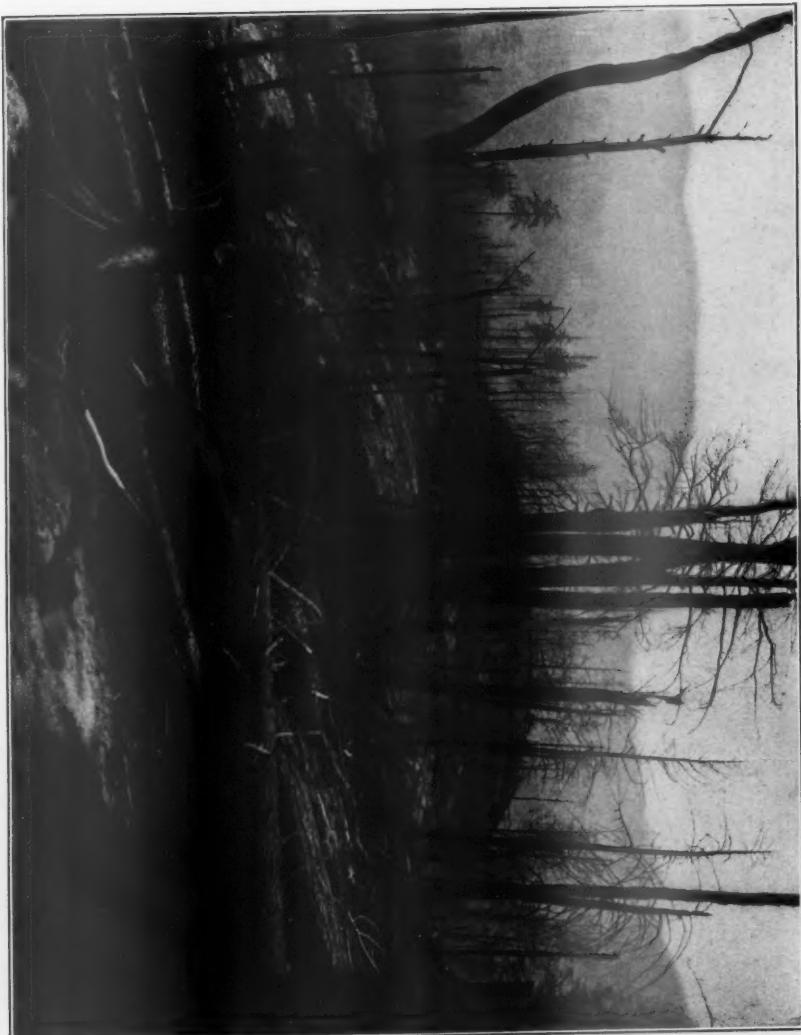
per acre per year—this is probably about equal to the natural growth. The balance of the supply, or 21,000 cords, per year has been purchased mostly outside of these two States. Following out their policy of conserving their own supply the cuttings by the Company for the past two years have been only 32,339 cords and the purchases 54,783 cords, a total of 87,122 cords.

Before the Company was formed little or no attention had been given to the conservation of timberlands in the lumbering operations in that vicinity. A great increase in the stumpage value of lumber, however, caused the Company to look forward with greater care to their future supply for the different mills in this division. With the in-



GROWTH OF SMALL SPRUCE AFTER LARGE TREES HAVE BEEN CUT FOR PULP WOOD.

LUMBER OPERATIONS INTERRUPTED BY FIRE AND GOOD TIMBER DESTROYED.





PULP WOOD CUT ON TRACT OF THE INTERNATIONAL PAPER COMPANY.

creased value of lumber of course the value of pulpwood also increased. Of their holdings in Vermont and New Hampshire the greater portion were lands which had been only partially logged and in many cases there had been no cuttings, in fact nine-tenths of their holdings when the International Paper Company was formed was a virgin growth. At that time in operating these lands no great care was taken to preserve the smaller growth and much timber was cut and left to waste that would now be used for pulpwood.

As an example of the difference in methods in the early days of the Company's operations and those in use at the present time I may quote the wording of contracts. Formerly when a lot of spruce was to be cut the wording of the contract would be that "the party of the first part agrees to go onto said lot and cut all the spruce timber and deliver it on the river bank." Now the contract for this same operation would read—"The party of the first part agrees to cut and deliver on the river bank all the spruce, down to twelve inches in diameter, two feet from the ground, except in solid growth on the sides of the mountain where the timber is to be cut clean. Said party of the

first part agrees that the work shall be done in a workmanlike manner, that he will cut only such trees as are marked for cutting or such as he may be directed to cut by an agent of said party of the second part (the Company); that all trees shall be sawed down close to the ground, that no spruce shall be used for corduroy roads or bridges or for skids or levers and that he will use all reasonable means to prevent the injury or destruction of small spruce trees and that all spruce timber cut, down to five inches at the top end, shall be removed from the land and delivered on the river bank."

Eight years ago the Company practically stopped cutting in Vermont, confining their logging operations in this vicinity almost entirely to New Hampshire. Since that time until the present year there has been no operating in Vermont, except a few small operations in four foot wood, on lands purchased in recent years. Their logging operations in New Hampshire were confined to the towns of Easton, Landaff, Benton, Woodstock, Lincoln, Orford and Lyme.

Logging operations have been confined for five years to the towns of Woodstock, Benton, Landaff, Lincoln

and Easton, N. H., the supply taken from those lands being driven down the Connecticut river to the mills in Bellows Falls. The entire cutting of timber for the past five years on these lands has been on very steep mountain slopes where the spruce was almost entirely of solid growth. On these slopes where it has been possible small patches of timber have been left with the idea of reproducing on the slopes from the seed from the small clumps of trees which have been left. We find this to be very practical as on cuttings of ten years ago, where there have been no fires, under similar conditions there is now a vigorous growth of young spruce coming in with the hardwood and bird cherry which usually follow where the timber has nearly all been cut off.

In these towns there were 21,346 acres which have all been logged over except about 2,500 acres, located around and near the top of Mount Moosilauke, which have been left, partly because it was expensive to log and partly as it

was thought best to leave it at this time with the idea that if it could be protected from fire it would aid in the reproduction of timber on the lower slope of the mountain by reseeding, where the timber has been cut very clean down to the hardwood growth.

On these lands where there has been a mixed growth of spruce and hardwood the spruce has been left to about an eight inch diameter, for future growth. The timber in this section was cut much smaller than the Company intends to cut on their lands hereafter as it was likely that it would not be profitable to log these lands again in the next sixty years.

In transferring their lumbering operations from New Hampshire to Vermont this season they are now cutting to a twelve inch diameter limit, two feet from the ground, in mixed growth. This is not a hard and fixed rule, however, much being left to the discretion of the Forester who has charge of marking the timber before it is cut. By



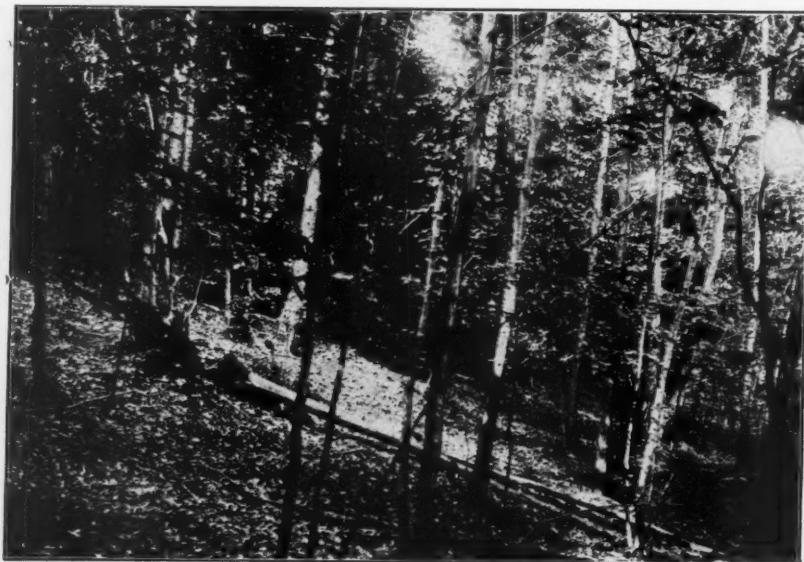
FIGHTING FIRE FROM BACK FIRE LINE.

having the timber marked by men who are well versed in forestry, the Company hope to preserve the young growth to better advantage than by leaving the selection of trees which are to be cut to the men who are doing the work. On the slopes where there is a solid growth of spruce the timber is cut clean, the trees themselves being trimmed and utilized down to four and five inches at the top end. When land is cut in this way if there is no source of natural reseeding by standing timber which will distribute the seed nor any small growth coming in, it will be planted in one or two years after logging operations are over with nursery stock grown at the Company's own nurseries.

The Company had never before had any marking done for the workmen in cutting timber, but this system is being practiced this year on all the logging operations of the International Paper Company. We expect that this will result in a great saving of the young growth and also in cutting the timber closer to the ground and into the tops as the same men who do the marking go over the cuttings from time to time and in addition to this they have a fore-

man who goes over the cuttings and who also looks after these details and in this way the Company expects practically to eliminate any waste. This system of cutting is applied entirely to timberlands on which there is a mixed growth of spruce and hardwood and on which there has been very little or no logging. On lands which have once been cleared and have come into spruce, which is called second growth or field spruce, the only system which is practical is to cut the timber into four foot wood, then let the timber grow until it is large enough for pulpwood and cut again clean. There are often on these tracts of land where four foot wood is cut, of the field variety of spruce, a sufficient number of seed trees, which are called bull spruce, and which we never cut, as they are rough and knotty and unfit for pulpwood. These trees will again seed the land into spruce, under favorable conditions, but when this is not possible it must be replanted to again get back into growing spruce.

The purchases of timberland in recent years by the Champlain Realty Company have nearly all been of the second growth or field spruce timber, as



YOUNG GROWTH ON A HILLSIDE.

owing to the high price of timberlands at the present time the Company finds that to buy lands on which there has never been any timber cut is unprofitable as there can be no increase of growth on lands on which there has never been any cutting. Lands which have been once cleared and used for agricultural purposes and have been abandoned and allowed to grow again into timber are found to be more profitable to hold for growth as the growth on such lands is often very rapid and sufficient, at a reasonable purchase price, to cover the interest on the purchase price and moderate taxes.

It is the Company's intention, in this division, to at least plant a tree for every one cut on their lands and as many more as they may be able to plant

conveniently and profitably. I know of no Company in the lumber business in Vermont or New Hampshire which at this time is doing as much to conserve and reproduce their lumber supply as the International Paper Company. To my knowledge none of the other lumber companies in these two States are conducting a nursery or doing any considerable planting on waste or cut-over lands. If all the lumber operations in Vermont and New Hampshire were to be conducted as conservatively as the operations of the International Paper Company the next quarter of a century would see a large increase in the amount of growing timber in both States.

*Paper presented at a meeting of the Vermont Forestry Association.

A WOMAN TREE CHOPPER.

D. Woodbury Bachelder of Manchester, N. H., engaged in the lumber business at Damariscotta, Me., has in his employ a most remarkable woman as regards strength and endurance. She is Mary Gregory, wife of Frank Gregory.

She first entered the employ of Mr. Bachelder to provide meals for the fourteen men in the camp. This she was able to do and have half a day left in which to engage in the work of the men, and asked permission of Mr. Bachelder to take her place with the choppers.

Mr. Bachelder gave his consent and was astonished to see her perform. She wielded an axe as expertly as any man in the crew and made a record one day of chopping, splitting and piling three cords of wood, a task that most men, hardened to the service of the woods, are incapable of equaling. Mr. Bachelder says:

"She is the strongest woman I ever saw. No sooner does she fell a tree than she is on top of it, limbing it out, and in every line of work she is the equal of the men in camp. She handles a crosscut saw with all the skill of a man and not a laborer in the camp can surpass her in the amount of work accomplished."

HISTORIC WASHINGTON TREE.

A historic old tree, believed to be 500 years old, famous also because it was used during the Civil War as a signal station, and by Confederate sharpshooters, when Gen. Early, in 1864, made his attack upon the national capital, has been recently cut down.

The tree was in perfect condition until struck by lightning recently. It stood about three miles north of the Capitol. Some Confederate soldiers killed during the two days' fighting, July 11 and 12, 1864, near the capital, were buried under it.



SPLENDID SPECIMEN OF NATIVE BURR OAK, IN OAKLYN PARK, AT LAKE CITY,
MINN.

From the Minnesota Horticulturist.

THE PROBLEM OF OUR LOGGED OFF LANDS

By J. J. DONOVAN

HE nation-wide interest in conservation of our resources has caused special attention to be given the great areas of stump land lying idle in every lumber producing State.

Lumbermen have been condemned unheard or unheeded as destroyers of a great resource and putting nothing in its place, by well-meaning men and women who have only superficially examined the situation or view it from the standpoint of the muckraker and sensationalist.

The land owner, after the trees are cut, has had to face archaic tax conditions, poor soil or heavy drainage or stump removing expense so that unless he had large capital and was willing to wait long for returns it was impossible to utilize the land. Choice spots near the cities and along the rivers have been cleared up, usually by industrious men of foreign birth who were not hunting a short cut to wealth, but many of whom now have fine farms and comfortable homes as a result of their struggles with the stumps. This method of reclamation has been slow and unnecessarily wasteful of labor and time.

Dynamite, donkey engines, gasoline and electric blowers, car pitting and, for all stumps save those of the Pacific Coast, horse machines greatly reduce cost when intelligently used.

When all excuses are made, the fact remains that there are many millions of acres of this cut over land lying absolutely useless in the United States today in spite of the land hunger that fills the waiting lines for weeks prior to any offering of land by the government and sends one hundred thousand American citizens each year to the Canadian Northwest. What is the matter? Some answer, "high taxes"; others, "poor soil"; others, "expensive labor, lack of markets, need of drainage," and so the story goes. There is

some truth in all these claims but there is room for millions of people on these lands and certainty of good returns if there is intelligent co-operation and direction.

I am fairly familiar with conditions in the northern half of the United States, and realize fully that the lumbermen are not wholly blameless but the legal and economic conditions are such in most cases that they have had little choice. The same men who demand that for every tree cut one be planted, object to changes in systems of taxation which make it possible to reforest with any chance of profit. Therefore much land reverts for non-payment of taxes to counties which continue the do-nothing policy of the original owner. When the States are owners and have sold the timber, they generally make no use of the logged-off land until some settler finds a choice piece of agricultural land which is then sold.

Whether the owner is the State or a private company or individual, we need a revision of our laws and awakening of interest so that land will be used:

First. Agriculturally wherever soil is suitable that our citizens seeking homes may remain under our own flag.

Second. For grazing if conditions do not warrant removing stumps and bringing under the plow.

Third. For reforesting such tracts as are not available for better uses.

How shall this be accomplished? For bringing stump land under the plow some advocate assistance from the State analogous to that given in reclaiming desert lands by irrigation, or by improvement districts similar to those under which swamp-lands have been reclaimed. Minnesota has a law of this character. In Washington many good men advocate State aid on one of the above plans. I doubt the wisdom of this policy and believe private enterprise can solve the problem

in every case where the real value of the land warrants the expense. Large holdings can be improved at less expense per acre than small ones and for this reason, if the logging companies themselves do not clear up the land, holding companies devoted to clearing and selling are necessary and such a plan is just being made effective in southwestern Washington. The Company which I represent, the Lake Whatcom Logging Company of Bellingham, Washington, has placed fifty-two individual settlers or families on logged off lands during the past five years and not one has thrown up his contract. Most have paid up in full, are prosperous and contented. Our theory is to sell in small tracts to actual settlers at reasonable prices on easy terms and to help with lumber and clearing where moderate payment is made. We do not offer land until we have opened roads and secured fair mail and school facilities.

Wherever the soil is good and companies secure a good class of settlers, this plan will solve the problem. The second class lands suitable for grazing or too remote from centers of population to warrant expense of removing stumps can be made of value by burning over in the spring or fall and following up with a moderate sowing of timothy and clover as soon as the ashes cool. Anyone interested in this phase of development should obtain the U. S. Department of Agriculture's Farm Bulletin 462, "The Utilization of Logged-off Land for Pastures in Western Oregon and Western Washington," by Byron Hunter and Harry Thompson, who have investigated the question at length and have deduced many valuable conclusions. The bulletins of the L. O. L. Association of the State of Washington contain much information of value. Its President is Mr. J. W. Brown, Alaska Building,

Seattle, Wash., from whom these bulletins may be obtained. This organization, formed in 1908, secured co-operation of the State of Washington and of the agricultural department of the United States, and much reliable information has been compiled as to clearing costs and methods.

Reforestation cut-over lands scientifically has made little progress on the Pacific Coast even inside the United States Reserves, the area treated being a very small percentage of the whole. The States and private individuals have done practically nothing as yet because there was neither economic reasons nor public sentiment requiring it. This condition is changing and most of the States now have forestry departments whose importance is being realized and supported by the legislatures.

Existing tax laws make impossible reforestation by private owners except in isolated cases. Land suitable for such purposes should be acquired by the State at a maximum price of say five dollars per acre and modern practical forestry methods applied which will transform a waste into a source of lumber supply and revenue to the State fifty years hence. Each State should classify its cut-over lands under one of the three heads given and sell the two first named classes. The balance should be reforested. When these suggestions are applied to the idle tangle of brush and stumps covering many millions of acres in the North and West, conditions will no longer reproach the lumbermen nor the people of the State affected. There are homes for millions under far more favorable conditions than govern life on the cold northern plains but co-operation and intelligence are needed to make these lands available.

*Address at convention of National Lumber Manufacturers Association.

CITY FORESTER NAMED.

Park Supt. Charles G. Carpenter has been appointed city forester of Milwaukee, Wis., by the park board, in conformity with a law of the legislature of 1911. Mr. Carpenter will serve without salary, it being necessary to appoint a forester prior to June 20. Only \$1,200 is available for salary of the forester, and the board decided that the city forest activities for this year would be limited.





PINCHOT TO THE BOY SCOUTS

GIFFORD PINCHOT, Chief Scout Forester of the Boy Scouts of America, has prepared for the Boy Scouts a statement showing how they may learn the age of a tree; how they may estimate the size of the tree ten, twenty or thirty years ago, and especially how to gain practical and valuable information in their trips through the woods.

In this statement Pinchot appeals to the Boy Scouts to co-operate with the foresters, saying that it is a duty which the boys owe to their country. "It is as important," he writes, "that you should study these things as that the foresters should do so. The foresters, being trained men, will know how to make the best practical use of what they learn. But it is upon all of us that the responsibility will fall of carrying out what the foresters recommend; and anything you can do to get an idea of what forestry means in practice, is going to help you to co-operate with the foresters. That will help the woods, and help your country."

"If you can get into the woods where cutting is going on, even if it is only of small stuff for firewood, I suggest that you do this: Count the rings of growth on the stump of a tree, first making sure what kind of tree it is. Count the rings from the center outwards. Each ring means a year in the life of the tree, and the whole number of rings means the age of the tree. Then measure the thickness of the tree across the stump. If the tree has not yet been worked up into logs or into firewood, you can easily measure its height by running a tape line, or a piece of string, from the butt of the first log to the top of the crown, adding the height of the stump. If you make several of these 'stem analyses' on trees of different sizes and then compare the results, you will find out many interesting things about how that

kind of tree grows; for example, that it may grow fastest in height when it is young, fastest in diameter when it is older, and that later on in life diameter growth falls off and height growth is very, very slow.

"But even a stem analysis of one tree teaches you a great deal. It tells you, not only how old was the tree when it reached the size at which it was cut, but also how old the tree was at all sizes since it was a little seedling, for every tree has its own life history written on its ring of growth. Suppose you have measured an oak and found it to be fourteen inches thick and seventy years old. All you need to do to find out how thick that oak was when it was, say, thirty years old, is to measure out from the center the distance covered by the first thirty rings, multiply that distance by two and add an inch for the bark. That tells you very closely how big the tree was forty years ago, long before you were born.

"While you are making the stem analysis, don't fail to study the woods in which the cutting is going on. How do they look? Will they grow trees again like those that have been cut or has the forest been destroyed by cutting? Is the brush piled so that it can be burned up, or are the big tops lopped so that they will rot quickly, or is all this trash strewn over the ground, where it would burn fiercely, and kill what trees are left standing? Have too many trees been cut, so that instead of a forest there are only a few scattered, scrubby trees left, or are there enough to shed seed to plant the land to forest again? Have the trees been felled skillfully? Are the stumps cut close to the ground so as to waste no timber, or have they been cut high up in lazy-man's fashion? Have the logs all been taken out, or just the best ones, leaving a lot of wood lying on the ground?"

TAXATION OF FOREST PROPERTY IN NEW HAMPSHIRE

By J. H. FOSTER

Professor of Forestry, New Hampshire State College

OANY people know that it is unwise for assessors to place high valuations upon forest property, since such action encourages a rapid cutting of timber; few people, however, realize how grossly unjust the system of general property tax on growing forests may become if the assessed valuations are high.

The general tax law calls for the assessment of property at the actual sale value. In the past this law has seldom been enforced and its evil possibilities have been thus far avoided. The fact that assessors have generally been lenient in their appraisal of forest property has made the evil in the law seem less great and has deferred the issue up to the present time. This does not mean that the working out of the tax law has been satisfactory. It has been most unsystematic, unequal and unbusiness-like. Assessments on timber tracts have been ridiculously unequal as regards lots in the same town or in different towns. Many valuable woodlots attached to farms have escaped taxation altogether. Assessors are often unfamiliar with the values of forest property and have not taken the trouble to examine them. Too often they assess from hearsay or place a value only when the property has changed hands and then frequently only once before the timber has been cut off. Sometimes they are prejudiced in their appraisals and non-residents are more often the victims. The writer investigated the condition of forest taxation in New Hampshire in 1908 for the State Forestry Commission and the Federal Forest Service, the results of which were published in the report of the Forestry Commission for 1907-'08. In this investigation over 150

timber tracts and woodlots were examined and studied individually. Many examples of the most surprising inequality were detected but since assessments have been generally low, no great harm resulted.

The New Hampshire Legislature of 1911 created a permanent tax commission, consisting of three members, to have general supervision of all matters pertaining to taxation within the State. This commission within the past few months has in the performance of its duties directed that all property shall be assessed according to law; that is, at its full sale value. By so doing it has brought about a crisis in the matter of forest taxation, as subsequent events are bound to show.

Why is it? Not necessarily because it would be unwise to tax our forests at their full value and thereby lead to their early removal; not because we prize our standing forests and desire to see them remain; not because we need them to protect our slopes and watersheds, and consequently our streams, although these considerations are most important; not by any means because forests should not pay their just proportion of taxes; but entirely and fundamentally because the system of property valuation is wrong in principle and when applied to forests not yet mature would be iniquitous in practice. The consequences of the injustice are brought to a focus only when the assessments approach the actual sale values.

Why is the system wrong in principle? It is wrong because it is on the principle that the man who does not or cannot use up his income, but keeps it reinvested with his principal, is punished by an excessive tax. As

applied to forests, it is especially wrong because the income from the forest is available only at long intervals and instead of being removed each year to be spent and enjoyed or reinvested elsewhere, is stored up on the trunks of the trees and taxed not once but each succeeding year, over and over again, for forty or fifty years longer, until the timber is mature and ready to be cut. There is a fundamental difference between levying an annual tax on property producing an annual income and levying an annual tax on property producing an income only at long intervals. The difference is a matter of compound interest.

It may be illustrated in the case of two lots of land of equal value without any growth. One is planted to forest trees and the other to field crops in such a manner that each lot will produce an annual revenue of \$10. The field crop is harvested annually and the \$10 received each year for sixty years. The forest crop is harvested but once, at the end of sixty years where the accumulated income of \$600 is received. But during all these sixty years the income of \$10 withdrawn each year from the field crops has been accumulating at compound interest until at the end of the sixty years at 5 per cent the total value is not \$600 as is the case with the forest crops, but actually \$3,535.80 or nearly six times as much. If these two lots are assumed to be physically the same and are so taxed then no man would invest his money in forest property.

It is only fair to state at the outset that the burden of unjust taxation has never fallen upon timber property which is now mature. In the past taxes have not often led to premature cutting. The serious problem today rests with the young and partly mature timber and upon the land whose owner wishes to re-forest. It is the most serious obstacle to planting on a large scale by private owners. Timber now mature and ripe for the axe is kept longer on the tax list if the assessments are low, but since the taxes in

the past have been moderate no real injustice is done the owner if the valuation is raised. The mature timber represents a definite value which may be realized at any time. From the point of view of expediency, however, it is still unwise to increase the valuation abruptly. Except in the case of timber mature or nearly so the situation is entirely different. Valuations are now much higher than they used to be. There is little inducement to the private owner to establish forests or preserve his young growth when there is every promise that the taxes and accumulating interest during all the years to come, when the forest is yielding no tangible return, will ultimately consume a very large part of his profit. Who can say that some day after perhaps a third or a half of his future returns have been eaten up in taxes, his still immature forest may not be destroyed by fire? It is not a pleasant prospect for an owner who has spent so much in taxes to thus have his principal wiped out of existence without having had any returns from it whatsoever. There is little inducement to the private owner to plant forests or preserve young growth when he does not know from year to year whether the property will be assessed the same or whether the assessment will be increased 50 per cent or 200 per cent or more. Yet this is the situation that confronts the forest owner.

Old fields reforested now with pine and assessed at \$10 per acre, if allowed to grow for 50 years with a tax rate of 2 per cent and money valued at 5 per cent, will at the end of this period have accrued taxes amounting to at least \$85 per acre. With a net return of \$300 an acre, from the sale of the timber, this means over 28 per cent of the final profits absorbed by taxes. A valuation of \$10 an acre is not excessive under ordinary circumstances and the rate of 2 per cent is lower than the present average in New Hampshire. With a higher valuation and a smaller net return the money spent in taxes might easily reach 50 per cent or 75 per cent. In some cases it might mean confiscation.

These figures do not indicate that growing timber is an uneconomic enterprise. They do indicate that through the influence of taxes assessed annually upon property which does not offer an annual return, the final returns may be largely consumed if the assessments are high. This conclusion is recognized by every economist and beyond reasonable dispute.

It is only because the general property tax on forests has not been more effectively administered that the results up to the present time have not been more serious. It is only because the practice of forestry has not yet become seriously undertaken that our tax system has not been subjected to more hostile criticism. So far we have been busy with exploiting old forests instead of building up new ones. But the present conditions cannot continue. The practice of forestry by private owners must be undertaken and it is safe to say that the practice of forestry cannot be generally introduced under our present system of taxation.

What measures can be advanced for the relief of growing timberlands from the burden of unjust annual taxes? Surely not a relief which means exemption or favoritism. The most earnest advocate of reform in the present system does not wish for this. Exemption, rebate, and bounty laws to encourage reforestation have been passed by a dozen States. There is an exemption law on the statute books of New Hampshire today but it is valueless and ineffective. None of these schemes touch the real problem of taxation. A reform in the method of taxing forest lands must be fair to all and exemptions on this basis are unjustified. It seems probable that any system which would be fair and just to all property could not be applied to forests which have long enjoyed leniency in assessment and have now grown to maturity. In other words the problem is one of vital importance to young forests and those which may be established in the future.

There are only three methods of taxation possible which will establish equality among different land owners.

One is to legalize the assessment of a percentage of the actual sale value of property. If this percentage is fair, the results conform to those which would exist under a more theoretically correct principle. The second is a tax on the expectation value of the forest. This value is equivalent to the returns which will be obtained in the future when the timber is cut discounted to the present time. If the net income from the timber on a given lot 60 years hence could be determined now as \$150 and with money compounded at 5 per cent, the expectation value would be \$8.47. This amount only could in justice be taxed annually for the next sixty years. The objections to this method are vital, and would make it impossible of operation in this country at the present time. Timber values are constantly changing and it would be impossible to anticipate the value at any period in the future.

The third method would provide for levying taxes with a real approach to equity. It consists in a tax on the yield or income from the forest whenever an income is received. Such a tax may be applied to any forest, however managed, on the basis of actual returns. It simply means to take a certain percentage of the returns and this should of course be relatively large. In the case of our present iniquitous system, it has been shown possible to deprive the owner through a long period of years of as much as 50 or even 75 per cent of his final return. An income tax of 20 or 25 per cent therefore would be just and humane. Referring to the example just given to illustrate the expectation value method, 20 per cent of the income of \$150 or \$30 if taken as taxes, would be precisely the same as an annual tax of one per cent on the expectation value of \$8.47. While the expectation value method is used in parts of Europe, it is not feasible in this country. A tax on yield makes it unnecessary to estimate future values. It does not depend on a fluctuating rate of money value. It is in no sense based on supposition or guess work but upon actual returns received. If

an owner's timber is destroyed by fire, he would not lose the accumulated taxes as under the present system.

There would be many problems of administration to work out and there are practical difficulties which would be almost insurmountable if a deferred yield tax system were to apply at once to all standing timber. This is out of the question. Such a system must be introduced gradually and apply only to young forests or those just established. At first it should perhaps be applied only at the option of the owner.

The system would call for a separate classification of land which is at present impossible under the constitution of New Hampshire. A constitutional convention is to be held in Concord this

year and the duty of the delegates is obvious. The Constitution should be amended so that the Legislature may take up this problem of forest taxation and through suitable legislation give relief to those who would practice forestry by starting new forests and putting under better management those which are now under way.

The State of Massachusetts has already taken up the problem by passing a resolution through its legislature in 1911 and again in 1912, according to law and preliminary to amending the State Constitution so as to permit a separate classification of forest lands if the legislature so chooses. The proposed amendment will now be submitted to the voters of the State.

CHESTNUT BLIGHT WARNING

THE following warning to timber owners has been issued by the Pennsylvania Chestnut Tree Blight Commission:

"With the advent of Spring, the development and spread of the chestnut bark disease is especially noticeable, and unless owners learn how to recognize the pest, and promptly remove all cases of the blight, it is safe to predict that our native chestnut trees will be doomed to extermination. In the counties east of the Susquehanna river, in Pennsylvania, the conditions are regarded as exceedingly unfavorable and almost hopeless, but west of the river the outlook for saving the chestnut is far more encouraging.

"If the people of that part of the State co-operate with the Blight Commission, by felling the infected trees and destroying the diseased bark and brush, its further spread may be controlled. All trees showing infections, no matter how slight, should be removed at once and every particle of the diseased bark must be destroyed. This is the most practical and effective method of treating infected trees at the present time, and especially in sporadic cases. So far, no spray or application has been discovered that will remove or cure the disease, although there is no lack of remedies suggested by experimenters."

YALE BUYS FOREST.

Director Toumey, of the Yale Forest School, today announced that a pine forest, as an adjunct to the teaching of silviculture and forest operations, has been secured in the best white pine region of southern New Hampshire.

OPEN CHICAGO OFFICE.

Munson-Whitaker Co., foresters of New York City, announce the opening of a Chicago office in charge of H. S. Sackett, formerly Chief of the office of Wood Utilization of the United States Forest Service at 512 Commercial National Bank Building, Chicago.

QUESTIONS AND ANSWERS

Many of our readers frequently desire to secure some expert advice regarding various features of forestry work, and do not know to whom to apply for the information.

The Editor has accordingly decided to establish this column in which he will be glad to publish such questions as may be sent to him, and give the answers, whenever the questions relate to any detail of the work which this Association is doing or such information as it can give.

The Editor requests that communications be written on one side of the paper only and if possible, be typewritten.

Editor, AMERICAN FORESTRY:

Can you tell me if there is a public school in New Jersey where one can study forestry? If not, is there any college where one may work his way through the forestry course? I have a common school education but desire to take up forestry and am without the funds necessary to take the regular college course, being dependent upon what I can earn. I have been told that there is a forest school where one can take the course by promising to stay and work for the state for a specified time. Can you tell me if this is so and where the school is located? I will very much appreciate whatever information you can send me.

CHARLES HOCKENBURY,
Perth Amboy, New Jersey.

It is always difficult to get a technical education without some resources, and on the strength of what you write I can not strongly encourage you to pursue your intention. On the other hand there are schools at which a man can at least partly support himself while pursuing his studies. All things considered I suggest that you write to the Dean of the Forest School at Pennsylvania State College, State College, Pa., and to the Director of the Forest School at Cornell University, Ithaca, N. Y. From them you will learn what arrangements can be made. There are no forestry schools of any kind in this State, and the one to which you refer as offering instruction in consideration of a contract to work for the State is located in Pennsylvania, and as I understand is open to citizens of that State only. In whatever you do let me urge you to bear in mind that no man can hope to be a successful forester who is not fully prepared, first as to a liberal general education and next as to the full course of technical studies. Judging by your letter the full four years' course at Pennsylvania State College, or at Cornell should qualify you to fill a forester's position. There have been men who entered forestry by the side door so to speak, but the time for doing that is past. One who is not fully prepared will have as little chance of winning out as the lawyer or doctor who takes his degree from one of the diploma mills. I shall be glad to give you any other information that you want, or to

talk with you if you care to come to Trenton for that purpose.

ALFRED GASKILL,
New Jersey State Forester.

Editor AMERICAN FORESTRY:

I was much interested in your article in this month's American Forestry, on the propagation of deer and elk. In one paragraph of this article you state that a property of 160 acres can be fenced for about \$200 for elk and slightly more for deer. Will you kindly let me know what kind of fence you would suggest for this purpose and from whom to buy.

ARTHUR H. HACKER,
Staten Island, N. Y.

I refer you to a letter from Howard Eaton, of Wolf, Wyoming, in this same number for much information on the subject.—Editor.

Editor AMERICAN FORESTRY:

Will you kindly advise me what kind of trees I should plant in my garden?

E. W. DURANT, JR.,
Charleston, S. C.

Mr. George B. Sudworth, dendrologist of the Forest Service, answers this question for American Forestry as follows: I take pleasure in suggesting that the following trees should give satisfaction if planted on your property in South Carolina. I could advise you better if I knew the exact location of the proposed plantation and particularly the nature of the soil there. However, I am sure that the trees suggested will prove satisfactory and be well adapted for your purposes. The oaks and other broadleafed species suggested for use are designed to serve as shade trees. I have added three coniferous trees which I imagine you can well use as a matter of variety somewhere with the other trees:

Deodar Cedar (*Cedrus deodara*).

Italian Cypress (*Cupressus sempervirens*).

Cryptomeria (*Cryptomeria japonica*).

Water Oak (*Quercus nigra*=*Q. aquatica* of nurserymen).

Laurel Oak (*Quercus laurifolia*).

Willow Oak (*Quercus phellos*).

Magnolia (Evergreen), (*Magnolia grandiflora*).

Southern Winged Elm (*Ulmus alata*).

STATE NEWS

Maine

Members of the Kennebec Valley Protective Association, and their guests, representing timberland interests valued at fifty million dollars, enjoyed banquet at Augusta, Me., on May 10, covers being laid for fifty. Hon. Forrest Goodwin, of Skowhegan, was the toastmaster, Governor Frederick W. Plaisted complimented the association on the good work it is doing, and hoped that similar associations would be formed throughout the State. J. Gervin Peters of the Forest Service spoke on the private co-operative fire protection under section two of the Weeks Act and expressed the hope that an adequate fire protection fund of two cents an acre may in the future be secured. Attorney General Pattangall urged the active cooperation of all timberland owners in conserving the forests; Hon. J. P. Bass spoke of the forest conservation and forest protection legislation in the State and President W. R. Brown, of the New Hampshire Timberland Association, describing the methods and the work of his own association and suggested a federation of the Eastern associations, as well as those of the West, for more efficient protection. Governor Bass, of New Hampshire, in a letter regretting his inability to be present alluded to the fact that Maine was the first State to operate a system of mountain lookout stations for the protection of forests against fires. Joseph Williamson, of Augusta, spoke on a system of insurance of timberlands which he believed would raise the price of the lands and make them better investments.

Colorado

W. G. M. Stone, President of the Colorado State Forestry Association, writes that:

"Colorado has been one of the leading State hatcheries of opposition to the Forest Service. The principal spawn produced have been State's rights, retardation of mining, landlordism, curtailing settlement of the State by driving home-seekers to Canada by hundreds (?) of thousands, etc.

"These hatcheries have fallen into the hands of politicians and men eager to seize upon the natural resources of the Western States; hence the Lafferty Bill (H. R. 2980) in the House, and the Burnham amendment to the House Agricultural Appropriation Bill (H. R. 18900) now in the Senate.

"The aim of these measures is to get the Public Domain away from the Government into the hands of the several States embracing the public lands and thence into the hands of private and corporate owners at the earliest possible moment.

"As applied to Colorado much misrepresentation and sophistry have been employed by the emissaries of the movement by likening the Western States to the Eastern, when in fact they cannot be compared. Their physical conditions are as different as day and night.

"If the matter of turning the Forest Reserves over to the States were submitted to the people of Colorado, the measure would be voted down many to one. It is really a question of water supply and irrigation, and Colorado is in no condition, at this time, to take the public domain and care for the forests as the Forest Service is now doing. If the Forest Reserves should go into politics at this time they would simply go to the Bow-wows.

New Jersey

The Forest Park Reservation Commission of New Jersey has issued a circular letter to the township committees of the State calling their attention to the danger of forest fires arising from uncared-for roadsides on which brushwood is allowed to dry. The commission points out that "aside from its value in curtailing the number of fires started, a properly or even reasonably well-cared-for roadside affords in many instances the only secure line of attack in fighting an advancing fire." The State laws governing this matter are also quoted in the circular for the benefit of the committees.

Missouri

In co-operation with the United States Forestry Service the Forestry Department of the Missouri Agricultural College has started an experiment to determine the species of basket willow best suited to the climate of Missouri. The State has a large area of land lying along its rivers which is subject to annual overflow and is, therefore, not suited for ordinary crops, but which would be admirably adapted to growing the basket willow.

An acre of suitable land will produce from 1,000 pounds to 1,300 pounds of willow whips each year. They have an average value of five to seven cents a pound. The demand for willow rods of high grade, for the manufacture of baskets and willow furniture is constantly increasing. At present the United States imports over 1,000,000 pounds annually. It is believed that there is a large future for the industry in Missouri.

After determining the proper species for the State, the Agricultural College will endeavor to foster the industry by the distribution of cuttings.

Tennessee

In parts of the South, notably in Tennessee, farmers are dismantling rail fences thirty to forty years old to supply, at good prices, the lead pencil manufacturers of the East with red cedar wood. Over vast districts the only vestiges remaining of the red cedar forests that once supplied the pencil, the box, and, to a large extent, the furniture industry, are to be found in this form, or in the interior finish of ancient wooden homes.

Minnesota

"Good roads have an important bearing on forest fire protection," says State Forester Cox of Minnesota. "They not only give the State force a way to get in the forests but make it easier to get help in fighting the fires. The proposed International Falls-Twin City road will divide the northern part of the State into two forest regions, and can be used as a fire break to protect either one of the sections in case the other one is fired. The forest law of 1911 makes it necessary for all slashings and other débris to be disposed of. This is being done in all construction work and the Elwell roads which will go through this section will give the forest service effective fire lines."

It is the hope of the forest service that several great trunk roads be built in the Northern part of the State with laterals running to them. Several roads are suggested by Mr. Cox as being of great value to the forest service.

New York

The work of reforestation is being carried on at a good rate by Manager Switzer, of the Salisbury Steel and Iron Company of Dolgeville. Mr. Switzer this year planted 10,000 trees of the white pine, Norway spruce and similar varieties, obtaining his seedlings from the State. This makes a total of 40,000 trees that have been planted by Mr. Switzer within the past few years. They are all located in the watershed from which this village derives its municipal water and will naturally help very much to ensure a continuous supply of that water. Ultimately over 50 acres of land will be reforested by Mr. Switzer in this manner. The kinds of trees selected are specially adapted both as to climate and soil conditions to the territory in question. All that have been planted show a good growth and are thriving.

Kentucky

The Civic League of Lexington is up in arms because of the fact that many shade trees in that city are being destroyed in the process of street and sidewalk construction. The league has appealed to the city authorities to prevent, as far as possible, the removal of the trees in street construction.

In some instances, it is claimed by the league, entire blocks have been denuded of rows of handsome maples and oaks. Property owners, as a consequence, are uniting their protests with the appeal of the Civic League. They are right in protesting, for the trees should be spared wherever it is possible to do so.

Massachusetts

Stringent precautionary action against the white pine blister rust have been taken by the State Board of Agriculture when in an official order signed by H. T. Fernald, State Nursery Inspector, the importation of pines of all kinds having the leaves in groups of five, from any part of Europe into Massachusetts after June 1, is prohibited.

This action was taken because of the prevalence upon white pine trees, and their four varieties, of a very dangerous disease known as the white pine blister rust. This disease has practically ruined the growth of the white pine in Germany and France. Once established here, it would kill all young pines of the five-leaved group, and ruin the larger pines of the State forests.

Three places in Massachusetts are known to be infected with the white pine blister rust disease, but until the inspection by the nursery inspectors is completed late in this month, the exact amount of damage will not be definitely known.

This year there have been approximately only 10 shipments of young trees made into Massachusetts. Of these two were discovered by Deputy Nursery Inspector W. S. Regan to be infected and were promptly condemned.

Vermont

The Vermont State Forester is making extensive plans for the spring's work of reforestation on the various lands belonging to the State.

The series of experimental plantations on the Downer State Forest in Sharon will be continued by the planting of about 20,000 trees of the following varieties: White, Scotch and Austrian pines, Norway, and white spruce. The trees previously planted on this tract have done remarkably well and are now of great value in connection with the annual summer school held by the State Forester in co-operation with the college of agriculture of the University of Vermont.

A great deal of planting is to be done during the season by corporations and private owners. The demands upon the State Nursery have been unprecedented, over one hundred orders having been received ranging in amount from 1,000 to 60,000 trees. This largest order is made by the Rutland Light and Power Co., for the protection of the watershed in Chittenden and Rutland.

Oregon

Announcement has been made by the State Board of Forestry that there will be 65 men appointed in Oregon under the \$10,000 appropriation received from the Government through the Weeks law, these men to work in Oregon in patrolling the headwaters of the navigable streams of the State.

The State Board of Forestry also made announcement of completion of its manual and handbook for fire wardens in which the general policy of the Board for this year is largely announced.

In the appointment of the men under the Weeks law there will be about 57 of the men stationed west of the Cascade Mountains and the other eight will be placed east of the mountains. It was the intent of the law to protect the headwaters of navigable streams and the main navigable streams are west of the Cascades. The men west of the mountains will be apportioned from one to seven in various counties, according to the size of the counties, the quantity of the timber involved and the nature of the streams arising in the respective counties.

Michigan

At a recent meeting of the Michigan State Board of Agricultural Comfort, A. Tyler, of Coldwater, Branch County, was appointed to aid in the establishment and development of a system of forestry extension work in conjunction with agricultural extension work now being conducted by Michigan Agricultural College and Experiment Station.

The object of this work will be to create a State-wide sentiment favorable to this important and exceedingly valuable branch of Michigan agriculture. An effort will be

made to induce farmers and others interested to properly care for the farm woodlot which now is probably the most grossly neglected of our farm possessions. Much emphasis will also be placed on economical methods of improvement employing at first those within easy reach of the ordinary farmer.

Montana

Provision for the increase of the patrol force and other details looking to the more perfect protection of standing timber in the district of the Northern Montana Forestry Association were subjects of discussion at the annual meeting in this city Saturday. Through the annexation of more than 100,000 acres of the Big Blackfoot Lumber company and the Northern Pacific railway's holdings and an equal amount of individual tracts it was deemed advisable to increase the directorate from seven to ten members.

Wisconsin

Members of the State Forestry Board, who returned today from a four days' trip in Northern Wisconsin, reported that within the last four months practically 14,000 acres have been added to the forestry reserve at prices ranging from \$2.50 to \$4.50 an acre. Besides this, the State has under consideration the purchase of a 12,000-acre tract in the vicinity of Little Car Lake, near Tomahawk, from an old lumber company. It is believed this transaction will be consummated in a few days as a result of the board's visit. It is one of the prize pieces of land which State Forester E. N. Griffith has had his eyes on for the last three years.

NEWS AND NOTES**British Columbia Forest Act**

The British Columbia Government has passed the Forest Act for the creation of a forest protection fund, to which owners, lessees and licensees of timber lands are required to pay 1 cent per acre on their holdings. To the total sum thus secured the Provincial Government must contribute an equal amount from the public revenue. The entire sum will then be placed to the sole credit of the fund for the purpose of preventing forest fires. Every one agrees that the measure is a good one. The Lands Department has commenced the issuing of notices calling upon the owners, licensees and

lessees of holdings to contribute their cent per acre. All new licenses or renewals will be withheld until the contributions to the fund are made, so as to ensure the inauguration of the fire fighting apparatus at the earliest possible moment.

County Reforestation

As a result of the Act passed by the Ontario Government a year ago, empowering municipalities to engage in forestry work, the county of Hastings has taken steps to acquire waste lands for the purpose of reforestation.

Several counties in Eastern Ontario are now undertaking the reforestation schemes. These waste lands were being rapidly acquired by private parties for personal profit, but of late councils have awakened to the fact that these lands might just as well be reforested under municipal supervision and the profits to accrue be retained for the benefit of the whole people.

It is evident that at some far distant period the land at this place was covered with a dense forest, and that there was either a subsidence or that the water undermined the cliffs, and that there was a huge landslide, which led to a large crack being engulfed in the sea. This was again covered with a layer of sand only to be laid bare once more.

Turning Wornout Land Into a Forest

How an Ohio farmer is solving the problem of what to do with wornout land is told about in the *June Outing* by B. Sando. The farmer, he explains, owns an old homestead of sixty acres which he is desirous of keeping in the family. He does not live on the place, however, for the reason that farming on it has of late years been a decidedly losing proposition. He has, therefore, decided to plant the entire tract in trees. Already 35,000 Norway spruce have been set out, three and one-half feet apart each way on an area of about eleven acres.

These trees will be cut, as they become large enough, for Christmas trees. Chestnut seedlings will be planted in the spaces left by the removal of the spruce, and it is expected that these will come into bearing by the time the last spruce is cut.

In addition to the spruce, hardy catalpa, black locust, elm, box elder and sycamore have been planted. It is planned to put the entire sixty acres in forest within five or six years.

The owner is wise in planting several kinds of trees instead of confining himself to one species. His forest will be producing six or seven kinds of lumber, chestnuts and Christmas trees, all at the same time.

Tool Caches In The Forests

According to Forest Supervisor E. N. Kavanagh, fire protection plans for the Big Horn forest this year include the location of a large number of tool caches in different parts of the forest for use in suppressing fires. Provision for camp equipment and food supplies for the fire fighters has also been made and from all indications the fire fighting organization will this season be in better shape than ever before to handle possible fires.

"We are making a strenuous effort to get our fire fighting organization in better shape," said Supervisor Kavanagh, "and plan to handle the fire situation on the forest in a manner similar to that followed by city fire departments, with the exception that we must naturally depend to a large extent upon the settlers of the surrounding country for assistance in case of serious fires. Lines of communication for obtaining information regarding fires and diffusing the information thus acquired to all interested in their suppression have already been established, so that it will be virtually impossible for any fire to gain more than a few hours' start on us."

"The first necessity in fighting a fire is getting assistance to combat it, and the second, to furnish the fire fighters with necessary tools. In case of a bad fire, provision for food supplies and camp equipment must also be made.

Sunken Forest Uncovered

A prehistoric forest has been brought to light by the recent storm weather and heavy seas at Freshwater West, on the south Pembrokeshire coast, England. The action of the waves has resulted in the washing away of great quantities of sand, and there is now exposed to view a sunken forest of about a quarter of an acre in extent.

Where there was a stretch of unbroken yellow sand there is now a mass of black rocks and huge black gnarled trees, with their roots embedded in the rocks and earth. The trunks of these trees in many cases are in splendid preservation. In some cases the wood has simply changed color, while in others it is of the nature of coal. Most of the trunks are encrusted with sandstone, and it is probably due to this that they are so well preserved.

The Largest Live Oak

A woman in South Carolina boasts that her State has the largest live oak in the world. She says: "On the lawn of Middleton Place, near Charleston, there stands the sovereign of South Carolina live oaks. The age of this tree, as of many others near it, is beyond the knowledge of man. The waist of the trunk measures 36 feet 6 inches. Its spread from tip to tip is 126 feet. This is, as far as I can learn—and I have investigated quite a bit—the largest oak tree in the world."

Another Middleton Place specimen is probably the most beautiful in existence and second in point of size, having a trunk 27 feet in circumference. Another notable live oak is to be found on one of the terraces, near the parterre. Its waist measurement is only 23 feet 4 inches, but it has a spread from tip to tip of 170 feet.

"I heard of an oak tree at Meggetts, S. C., that was, and still is, the talk of the countryside. Conductors on the trains tell strangers of its great size. I sent to Meggetts and had measurements of the tree made. The trunk was only 25 feet in circumference and the spread 125 feet.

Hanging Forest Fire Starters

Up in Alaska there is a bitter feeling against those who cause forest fires. This is not strange, but the Alaskans are carrying things to the very extreme and a vigilance committee has been formed whose duty it shall be to hang every offender. The Yukon Valley is described in press dispatches in the latter part of May as being a roaring furnace, and this means that great property damage is being done. Now, what stirs these dwellers of the North into such action is the recognition of the fact that in the greater number of cases these fires are started by the carelessness of some individual. They do not consider that it is right that one man, because he did not use the discretion that mature years ought to bring, should inflict on others such damage as a forest blaze of any magnitude always entails.

Fighting The Beetle

The government is again taking up the fight against the small beetles that have been ravaging the forests of eastern Oregon. This year, however, the official in charge of the work expects to have a much easier task than last season, when more than \$15,000 was expended near this city in the war on the little insects.

Last year in the work large numbers of trees were cut down and burned and this year the men will cruise the area worked last year, making observations of the success of the work. They say the work last year was quite thorough and expect to find it was quite successful, leaving this section of the Whitman national forest practically free from the bugs, with but few isolated trees left standing for treatment.

Pennsylvania Railroad Tree Planting

The growing scarcity of timber suitable for manufacture into railroad ties, which has been responsible for a rapid increase in the cost of ties in recent years, has led the Pennsylvania to adopt a conservation scheme which includes the production of trees for its own use.

More than four and a half million trees have been planted by the Pennsylvania in the past ten years. Last year alone 515,703 trees were transferred from the company's nursery at Morrisville, Penn., to permanent places on railroad property. In 1909 1,000,000 young trees were set out.

At the nursery the Pennsylvania has in operation 36 acres which are kept up to practically maximum production. In 1911 483,148 forest trees were shipped from the nursery for company use, while an additional 46,558 ornamental trees and shrubs were used by the various divisions. The present stock on hand at the nursery is 2,296,833, of which 2,072,166 are forest trees, and 224,667 ornamental plants.

Forest Experiments

Plant Economist A. W. Sampson, of the government forest service, will have charge of the establishment of a government grazing experiment station at Manti, Utah.

Assistant District Forester O. M. Butler, of the silviculture department, and Assistant District Forester Homer E. Fenn, of the grazing department, will accompany Mr. Sampson to the Manti district. The foresters will experiment in tree reproductions, sheep grazing on streams, and establish a forest plant nursery to raise seed for grasses that are best adapted for that locality.

Fast Growing Eucalyptus

L. M. Pratt, president of the Pratt Eucalyptus Investment Co., of Los Angeles, Cal., sends a clipping which describes a Eucalyptus tree three years old, grown without irrigation in one of his plantations, closely surrounded by other trees of the same age. It measured 8½ inches in diameter, breast high; 12½ inches in diameter at the butt, and 55 feet in height at three years of age. A half acre plot in which this tree is located was measured when just three years old. The trees showed an average diameter of 5½ inches, and an average height of 55 feet. These trees are doubtless the largest trees for their age ever produced in a California plantation, if not in the world. It is almost unbelievable that trees growing so rapidly produce a timber as hard and tough as hickory, which takes 90 years to attain a 12-inch diameter.

Raising Big Tree Seedlings

The Forest Service is raising several acres of big tree seedlings on the Tahoe National Forest in California, at a more northerly point than any natural big tree grove. While the giant sequoias are found in the forests of the Sierras at various points throughout a total range of some 250 miles, in the northern two-thirds of this range there is practically no natural reproduction. It has consequently been a question whether the species would not practically disappear from this region when the present mature trees die.

The most northern existing grove of big trees is on the Tahoe Forest, but about 34

miles southeast of the site selected for planting. This site is on a moist flat not far from Nevada City, and is about 2,700 feet above sea level. The first seeding was done in the fall of 1910, with very successful results, and last fall an additional area was seeded.

The method used in planting the seed was that known to foresters as "the seed spot method." Spots about six feet apart each way were prepared by pulverizing the

earth with a garden hoe. Seeds were then dropped on these spots and lightly pressed in the soil with the foot. The flourishing condition of the young seedlings gives good reason to expect a future growth of big trees at this point. With protection of forests from fire there seems to be no reason why the big trees should disappear; even though scientists regard them as survivals from a past age, botanically speaking.

BOOK REVIEWS

Forestry in New England: By Ralph C. Hawley and Austin Hawes. New York; John Wiley & Sons. 1912. Pp. XV + 479. Illustrated.

Teachers, students and practitioners of forestry will welcome this book which deals in so comprehensive and authoritative a manner with the specific forest problems of New England. The authors are practical foresters who have devoted years of study to forest conditions and management in the East. In the light of their own experience they have gathered together and made readily available the results of investigations which have been made from time to time, the records of which have previously existed in a heterogeneous mass of bulletins, articles, and reports. In preparing this book the authors had in mind two distinct purposes: First, to present a treatise or manual of practical value to all classes of land owners in the East; and second, to produce a textbook treating of forestry in New England. The latter is greatly needed at this time, especially in the various agricultural colleges where courses in forestry are given and where it is essential that thorough instruction in the

forest problems of the northeastern United States be furnished. There is a still wider field for a book dealing with a specific portion of the country, so arranged as to serve as a ready guide for owners of woodland in that section. It has evidently been the aim of the authors to present the matter in the simplest and least technical form possible without sacrificing accuracy, to the end that readers not familiar with forestry may have no difficulty in following the discussion throughout.

As a textbook for post-graduate schools giving the highest grade of instruction in forestry this book will have a greater value for its detailed discussion of New England forests than for the portion dealing with general forestry. But for numerous undergraduate schools giving a slightly lower grade of instruction all portions of this book will prove useful. To the owner of woodlands in the region it will afford not only general information in regard to forestry and its application in New England, but also practical assistance in the detailed treatment of his local forest problem. S. J. R.

EDUCATIONAL

The Biltmore Forest School

The early spring found the Biltmore Forest School returned from its winter quarters in the German forests and encamped near Biltmore, N. C., at the snug logging camp of the Champion Lumber Company, owners of 135,000 acres of the finest timberland existing in the Southern Appalachians. No better setting for the course in "Logging and Lumbering" in which the school is now engaged can be imagined than that met at "Sunburst." Here the mountains rise to elevations of 6,550 feet. The slopes are steep, and the stumpage is unequally distributed over the entire area. Thus it happens that the logging problems confronting the Champion Lumber Co., whose hospitality the Biltmore Foresters enjoyed at Sunburst, are very diversified and intensely interesting.

Near the camp of the Biltmore Forest School, some 16 miles down the meanders of beautiful Pigeon River framed in flowering mountain laurel (*Calmia latifolia*), rises the smoke from the giant fibre works owned by the friends of the Biltmore Forest School, the Champion Fibre Co. Theirs is the hugest fibre plant, by far, to-day existing in the South. 500 long cords of spruce, hemlock, pine, basswood, and notably chestnut are here converted, every day, into fibre by the sulphite and by the soda process of manufacture.

The lecture work during the stay of the Biltmore Forest School in the camps of the Champion Lumber Co. occupied the entire forenoons. Logging and lumbering was the main topic of Director C. A. Schenck's course. Dr. House lectured on plant physiology and morphology; Dr. G. L. Sioussat

on Economics; Mr. H. B. Hudson on Law for Lumberman; Mr. Franklin Sherman on Entomology and Mr. C. S. Brimley on General Zoology. The entomological and zoological lectures were going hand in hand with the field work.

From its Southern spring camps, the Biltmore Forest School is about to move to its Summer camps at Cadillac, Mich. En route to Michigan, the School visits the giant paper plant of the Champion Coated Paper Co., with which the Champion Lumber Co. and the Champion Fibre Co. are affiliated) at Hamilton, Ohio. The three steps in the manufacture of paper are thus studied, from the stump of the tree to the consumer. Thus it happens that the students become acquainted, in the course of their travels, with the various steps of the conversion of the trees into the necessities of life.

In August, the Biltmore Forest School moves for its fall camps at Marshfield, Oregon. In October, the School sails for its winter quarters in the German forests.

Mr. Spring Goes to Cornell.

The trustees of Cornell University have appointed Mr. Samuel N. Spring, of New Haven, Connecticut, professor of forestry at Cornell University, and he will begin his work at Ithaca at the opening of the next college year. Mr. Spring will teach the courses in forest planting and the forest nursery, forest protection, forest policy, and a general introductory course.

Mr. Spring graduated from Yale College with the degree of B. A. in 1898. For the

next three years he was engaged in a wholesale dry goods business in Chicago, after which he returned to the Yale Forest School, graduating from that institution in 1903, with the degree of Master of Forestry. The next two years were spent at the University of Maine, where he was professor of forestry in charge of the department. He spent the summers of 1902, 1903 and 1904 in work in New England for the U. S. Forest Service.

From June, 1905, until January, 1909, Mr. Spring was constantly in the employ of the U. S. Forest Service, holding successively the positions of forest assistant, assistant forest inspector, chief of the section of co-operation in the Office of Extension, and chief of the Office of Extension. He was engaged in private forestry work from January, 1909, until the fall of that year. Since the fall of 1909, he has been State forester of Connecticut, forester to the Connecticut Experiment Station at New Haven and special lecturer in the Yale Forest School and at the Connecticut Agricultural College—all of these positions have been held continuously since the fall of 1909.

Mr. Spring is a director of the American Forestry Association.

His publications include two articles on "Forest Fires" and "White Pine," in the reports of the Maine Forestry Commission for 1904-'06; Bulletin 63, U. S. Forest Service, "Natural Replacement of White Pine in New England"; Circular 41, U. S. Forest Service, "Forest Planting on Coal Lands in Western Pennsylvania"; "Forest Fire Manual," published by the State of Connecticut; "Report of the State Forester of Connecticut for 1910."

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